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JPRS Report

**Nuclear
Developments**

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JPBS-TND-90-020

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Violation of Iraqi Arms Embargo Denied
*HK1710082390 Hong Kong AFP in English 0812 GMT
17 Oct 90*

[Text] Beijing, Oct 17 (AFP)—China has given the United States its word that it is respecting a United Nations embargo on arms shipments to Iraq, Western diplomatic sources said Wednesday.

It also assured Washington that no lithium hydride—a chemical that can be used to make nuclear weapons or chemical weapons—has been delivered to Iraq, the sources said.

The SUNDAY INDEPENDENT newspaper in London reported September 30 that a contract to deliver seven tonnes of lithium hydride to Iraq was signed by state-owned China North Industries Corp. soon after Iraq invaded Kuwait.

The diplomatic sources, requesting anonymity, said China's assurances that it is abiding by U.N. Security Council Resolution 661 banning arms sales to Iraq had been made to the United States at various levels.

"There is no good evidence that China has violated 661," one source said.

China, a major source of weapons to both Iran and Iraq during the Gulf war in the 1980's, had vowed publicly that it would halt arms shipments to Iraq shortly after Iraq invaded Kuwait on August 2.

As one of the five U.N. Security Council permanent members, it also backed Resolution 661.

UN Envoy Stresses Peaceful Nuclear Energy Use
*OW2410014490 Beijing XINHUA in English
0058 GMT 24 Oct 90*

[Text] United Nations, October 23 (XINHUA)—China reiterated today that it pursues the policy of not advocating, encouraging or engaging in nuclear weapon proliferation and not helping other countries develop nuclear weapons.

Chinese Ambassador Hou Zhitong told the U.N. General Assembly session this afternoon that the Chinese Government supports the three major objectives set forth in the treaty on the non-proliferation of nuclear weapons (NPT), that is, preventing nuclear weapon

proliferation, promoting nuclear disarmament and facilitating the peaceful use of nuclear energy.

The Chinese ambassador made the remarks when the U.N. General Assembly considered the report of the International Atomic Energy Agency (IAEA), which reviews the agency's activities during 1989 and outlines developments in the peaceful uses of nuclear energy during the past year.

He stressed that China is in favour of nuclear weapon non-proliferation, but more importantly, it advocates the complete prohibition and thorough destruction of nuclear weapons. "Only significant progress in nuclear disarmament can truly strengthen the authority of the non-proliferation regime," he said.

In the twenty years since its entry into force, the NPT treaty has produced some positive effects on the prevention of nuclear weapon proliferation, contributing to a certain degree to the maintenance of world peace and stability. The treaty reflects the just aspirations of numerous non-nuclear-weapon states, particularly the developing countries, for the complete prohibition of nuclear weapons and the birth of a nuclear-weapon-free world.

Referring to the peaceful use of nuclear energy, Hou said the development of nuclear power is the main purpose of China's nuclear industry. China has made new progress over the past year in nuclear power development. It is expected that China's total installed nuclear power capacity would reach 6,000 megawatts by the end of the century, he said.

The Chinese ambassador hoped that the international cooperation would be further strengthened in the field of peaceful use of nuclear energy.

"China will, as always, develop cooperative relations with the International Atomic Energy Agency (IAEA) and make new contributions to the strengthening of cooperation among all countries on the basis of the principles of mutual respect for sovereignty, non-interference in each other's internal affairs, and equality and mutual benefit," he declared.

The IAEA, an intergovernmental agency, was established in 1957 with the aim to seek to accelerate and enlarge the contribution of atomic energy to peace, establish standards for nuclear safety and environmental protection and ensure that nuclear materials and equipment intended for peaceful use are not diverted to military purposes.

CZECHOSLOVAKIA

Exporting Uranium to USSR Discontinued

*AU2610133590 Prague LIDOVÁ DEMOKRACIE
in Czech 23 Oct 90 p 2*

[Unattributed Moscow dispatch: "It Should Have Come Earlier"]

[Text] In connection with the warming of the international atmosphere, the Soviet defense industry no longer needs Czechoslovak uranium. A. Shishkin, general director of the Soviet Tekhsnabeksprom enterprise, told the Soviet IAN (formerly NOVOSTI) Agency. He confirmed information published in the CSFR that, as of the beginning of 1991, the Soviet Union will not import Czechoslovak uranium, except for amounts required for reprocessing for the needs of the Czechoslovak nuclear power industry, which is a common practice in relations with Western partners. He refused to mention how much the Soviet Union will receive for the provision of these services. The suspension of exports of Czechoslovak uranium to the USSR was reported by J. Svoboda, general director of the Czechoslovak Uranium Industry Příbram, on 12 October. In an interview for CTK he stated, among other things, that uranium "used to be sold somewhat uneconomically." The state treasury had to subsidize every unit of uranium exported to the USSR with about 60 percent of the price.

UN Delegate Cited on Future Nuclear Development

*LD2410111690 Prague CTK in English 1005 GMT
24 Oct 90*

[Text] New York Oct 23 (CTK correspondent)—In the future construction of nuclear power plants Czechoslovakia does not want to be technologically dependent only on the Soviet Union and will therefore invite tenders from foreign firms, Czechoslovak permanent representative in the UN Eduard Kukan told the UN General Assembly here yesterday.

In a discussion on the report of the International Atomic Energy Agency (IAEA) he announced that according to a Czechoslovak Government's decision inspectors of the Agency, as well as all UN employees, will be allowed to travel to Czechoslovakia on business without visas.

Bohunice Nuclear Power Plant Poses No Danger

*AU1710151390 Prague CTK in English 1849 GMT
12 Oct 90*

[Text] Bratislava Oct 12 (CTK)—None of the defects registered during analyses conducted at the Jaslovské Bohunice Nuclear Power Plant in West Slovakia by the Assessment of Safety Significant Events Team (ASSET) were characterized as an accident that could threaten the plant's neighborhood.

The ten-member ASSET mission, one of the forms of aid given by the International Atomic Energy Agency (IAEA) to its member states, has just finished one of the seven expertises, conducted at Czechoslovakia's request.

At a press conference today, Maurice Rosen of the Vienna-based IAEA who headed the expertise stated that 183 of the total of 1,523 defects registered during the mission's activities were related to safety, while over 50 per cent of them can be ranked in spheres such as radiation protection and minor leaks of primary coolant from technological systems.

The ASSET mission recommended the drawing up of a comprehensive defects and accidents prevention program for both units of the V-1 power plant and installing more modern fire-extinguishing equipment.

POLAND

Nuclear Industry Said To Need Western Technology

*LD2410132790 Warsaw PAP in English 1102 GMT
24 Oct 90*

[By PAP correspondent Adolf Reut]

[Text] New York, Oct. 24—"Poland approves the conclusions contained in an annual report of the International Atomic Energy Agency [IAEA], appreciates the agency's activity, and declares its readiness to take part in its work," Poland's representative at the United Nations, Stanislaw Pawlak, said while addressing a debate on the report held by the UN General Assembly on Tuesday.

But he added that Poland could rebuild its confidence in possibilities offered by nuclear power engineering only when the equipment was properly tested by Western highest quality technologies.

ARGENTINA

Nuclear Inspection Mechanism With Brazil Studied

PY1910182390 Buenos Aires DYN in Spanish
0038 GMT 19 Oct 90

[Text] Brasilia, 18 Oct (Reuter)—Itamaraty, the Brazilian Foreign Ministry, today reported that Brazil and Argentina have begun negotiations to establish a bilateral mechanism to safeguard and to inspect nuclear installations.

Itamaraty Spokesman Jose Vicente Pimentel said these two countries have the most advanced nuclear technology in Latin America. They seek to strengthen previous agreements on cooperation and the peaceful use of atomic energy through a mechanism similar to the Tlatelolco Treaty, which in 1967 banned the use of nuclear energy for military purposes in Latin America. Brazil and Argentina are signatories of that treaty, but so far only the Brazilian Government has ratified it.

Neither of the two countries have signed the Nuclear Nonproliferation Treaty (TNP) which was established in 1968 at the United Nations, and they keep their respective nuclear plants away from the supervision of the International Atomic Energy Agency (IAEA).

Pimentel referred to the discriminatory nature of the TNP and said it does not ban nuclear weapons in countries that already had them before 1968.

When the new Brazilian Government was installed in March, President Fernando Collor de Mello assumed a firm commitment that nuclear energy in Brazil would be used exclusively for peaceful purposes.

Brazil's recent participation in an Iraqi military project involving missile technology has elicited threats by the United States to restrict the sale of supercomputers to Brazil.

Brazil and Argentina in 1988 signed a cooperation agreement for the peaceful use of nuclear energy, [word indistinct] a statement issued then, they declared their "inalienable" right to develop, without restrictions, their respective programs in that sector.

Nuclear Cooperation Project With Turkey Slated

PY2010005090 Buenos Aires TELAM in Spanish
2022 GMT 19 Oct 90

[Text] Buenos Aires, 19 Oct (TELAM)—Argentine and Turkish authorities have agreed to establish a binational company that will build two low-power nuclear reactors. In this project, Argentina will provide the know-how, and Turkey will finance the project.

CNEA [National Commission for Atomic Energy] Chairman Manuel Mondino told this to TELAM in a telephone conversation from Ankara. Mondino said

that, although "nothing has been signed" yet, Turkish President Turugt Ozal "has approved" the project.

CNEA Chief Discusses Cooperation With Turkey

PY2610001990 Buenos Aires TELAM in Spanish
1805 GMT 22 Oct 90

[Text] Buenos Aires, 22 Oct (TELAM)—The agreement that will be signed by Argentina and Turkey, which foresees the construction of a low-power nuclear power plant in each country and seeks to develop new markets, represents a technological achievement for the National Commission for Atomic Energy (CNEA) and reveals a new source of hard currency for Argentina.

CNEA Chairman Manuel Mondino announced in Turkey the creation of a binational association for the construction of two new CAREM 25 [expansion unknown] reactors using Argentine technology and Turkish financing. This will place Argentina in the international league as an exporter of nuclear technology, a field that until now was restricted to a few western world powers.

Although the agreement has yet not been signed, the great support for the initiative given by Presidents Carlos Menem and Turgut Ozal has decidedly consolidated the project. The initial negotiations began in May 1988. Following the completion of the legal and administrative details, the construction will begin by the end of this year or the beginning of 1991 at the latest.

The CAREM reactor has been developed by the Invap (Applied Investigation) Company. The main shareholder of this company is the CNEA, while the remaining shares are owned by Rio Negro Province. The unit is a small, fourth generation power plant whose main advantage is that it is modular and as such allows for expansion: from its initial 25 megawatts (mw) its power output can be doubled or tripled by just adding more modules.

Its electricity output is considerably smaller than that of the Atucha (365 mw) or Embalse (650 mw) power plants; however, it is less costly and its installation time is shorter, thus making it more suitable for the needs of Third World countries where financial resources are also significantly smaller. Another advantage is that its modular design means that energy can be supplied to small and distant towns that are not connected to a primary grid because of the high costs of cable laying and high-tension pylon construction.

Nuclear energy must be able to demonstrate that it is not only cheaper and longer lasting but also safer. The operational safety level of the CAREM design is 20 times better than that of the Atucha I plant, and it is virtually impossible for an accident to occur.

Mondino, who spoke with TELAM from Turkey, said that this association "should make us feel proud" since "doors to new markets will be opened and the presence of our technology will be felt" at an international level.

He said: "We have yet not signed anything," but added that President Ozal "has given the green light" and his "total support" to the project. He said that he considers that we are near "a very important date for Argentine technology."

The CNEA chairman, accompanied by Argentine Ambassador Leopoldo Saracho, spoke with the Turkish president for nearly an hour about the possibility of establishing a "joint venture" [preceding two words in English] for the installation of two prototype minipower plants, first in Argentina and then in Turkey after which the association will begin selling the reactors to other countries.

Initial market research shows that sales of CAREM reactors will be successful in the Middle East, some Asian countries, Africa, and Latin America. Argentina will try to create a market in its area of influence—Latin America—and Africa, while the binational association will export reactors to other countries.

The CNEA has already installed two research and training units abroad within the framework of scientific and technological agreements. The first unit to become operational was the RP-10 [expansion unknown] in Peru on 19 December 1988. It has a capacity of 10 mw and also produces radio isotopes for medical use.

On 3 April 1989, the Nur (which in Arabic means light) reactor was installed in Dradia, Algeria. It has a capacity of one thermic mw and produces a small quantity of radio isotopes.

The association with Turkey will allow Argentina to begin selling nuclear power plants in the international market, and this will represent a good source of hard currency for the country. It will also reactivate a large industrial complex that is currently idle following the paralyzation of the Atucha II power plant.

Mondino remained for three days in Ankara, Turkey, before traveling to the Soviet Union "to sign agreements with that world power." He did not reveal the contents of those agreements.

France Proposes Fixed Nuclear Waste Dump

PY2310184890 Buenos Aires DYN in Spanish
1818 GMT 23 Oct 90

[Text] Buenos Aires, 23 Oct (DYN)—A report published in today's issue of the EXTRA newspaper states that the world's first permanent nuclear waste dump may be built in Argentina if the national government accepts a French proposal, involving millions of dollars, to install it in Chubut Province.

Tomorrow, the Latin American chapter of the Greenpeace ecological organization will denounce construction of this toxic waste dump before the courts, and will report the names of Argentine officials and of businessmen in both countries who are allegedly involved in the issue, the newspaper states.

According to the report, the dump will be built at Gaste, Chubut Province. If this happens, however, radiation will increase the health risks for inhabitants of the Patagonia Region.

An article accompanying the detailed report mentions that construction of this nuclear dump has been on hold since 1978, when Rear Admiral Carlos Castro Madero, retired, presided over the National Atomic Energy Committee.

The report also states that, even if the proposal is not accepted, "nuclear accidents similar to the one at Chernobyl could occur" in Argentina since "any failure at the Atucha I plant could cause several deaths through direct radiation and spontaneous abortions, and many other deaths later as a result of radiation, drinking water contamination," and other harmful effects.

The toxic effect of the nuclear waste, which generates a permanent heat of 60 degrees [not further identified], ends only after hundreds of thousands or hundreds of millions of years, the report concludes.

BRAZIL

Editorial Criticizes U.S. Computer Embargo

PY1910213590 Sao Paulo *O ESTADO DE SAO PAULO* in Portuguese 14 Oct 90 p 3

[Editorial: "Brazil and La Fontaine"]

[Text] President Collor de Mello's administration is continuing to pay heavy cost in the field of foreign policy that it inherited from previous administrations. Neither the Brazilian Foreign Ministry nor the president's frequent reiterations, followed by concrete actions, that the New Brazil rejects everything that previously prevented the country from joining the select group that makes decisions and shares and defends identical values, have impressed the U.S. Congress. Every time the new administration asserts that everything has changed, someone recalls some contradictory past action. We believe that the fable of the wolf and the lamb is being applied on a daily basis to Brazilian international relations. In addition to that, Itamaraty has not yet found the straight path that will enable the country to confirm its sovereign position in the international scene without having to resort to the nationalist and Third-World-like rhetoric that has characterized so many of the previous administrations.

The latest evidence that the spirit of La Fontaine's fable inspires those who claim to be friends of Brazil is the U.S. Congress decision to forbid the export of supercomputers to any country that has officially or unofficially helped Iraq, either now or in the past, to improve its rockets or its technological ability in the fields of chemical, bacteriological, or nuclear warfare.

The bill, which was approved by the U.S. Congress on 11 October, is extremely wide-ranging. To be sentenced to

the technological "punishment," this assistance rendered to Iraq need not even had to be official. If a private citizen has cooperated with the Baghdad Government it is enough to render his country liable to punishment. This bill, naturally, does not intend to hinder the technological development of the EC countries that have supplied Saddam Husayn's administration with gas plants and the technology to manufacture the gas. It is aimed at penalizing Brazil. European countries do not need the U.S. supercomputers; Japan much less. Brazil, however, needs them and the Brazilian Government wanted to purchase one for Embraer [Brazilian Aeronautics Company].

Apparently the difficulties had been overcome during the negotiations of the two executive branches, and the Brazilian Government was authorized to purchase the supercomputer. Following the new Senate decision, however, the technological know-how of Embraer (and consequently of the entire country) has been affected and the competitive effectiveness of medium-size aircraft in the international market (including in the United States) has been reduced. The truth is that U.S. Senate believes that the supercomputer will help the Brazilian military to construct the bomb!

At the opening of the UN Assembly General, President Collor de Mello said that Brazil has given up all nuclear tests, including those for peaceful objectives, but his words were not believed. The fact that the Brazilian Constitution holds Congress responsible for overseeing the nuclear program was not taken into consideration by those who believe that atomic bombs are continuously being built all over Brazil. We must add to that the fact that the Brazilian Congress does not like the military and makes it very difficult for the president to get his policies approved. None of these facts, however, seem to be relevant to the U.S. Congress. What really matters to them is that Brazil has sold weapons to Iraq and that one retired brigadier has been contracted, privately, by the Baghdad Government to manufacture an air-to-air rocket and to improve the performance of a Soviet rocket that has been purchased by the Iraqi Government. The European, Soviet, and even the U.S. businessmen who have sold weapons to Iraq do not seem to exist.

The U.S. Senate has the right to legislate on the trade of sensitive technology produced in its country. It also has the right to complicate, if it wants to, U.S. relations with Brazil by not paying attention to the words of the president of the second largest power in the hemisphere. Those are the internal problems of the United States. We do need, however, to know how the president and the Foreign Ministry plan to implement a foreign policy which does not depend on the mood of the majority of the U.S. senators or on the pressure of the lobbyist who know how to operate in Washington.

President Collor de Mello personally opposes the idea that Brazil should have nuclear weapons or that it should manufacture nuclear artifacts for peaceful objectives as authorized by the Tlatelolco Treaty. He has never,

however, publicly declared himself against the idea that the country should achieve technological capacitation in this or any other field of high and sensitive technology, as the experts normally refer to it. The U.S. Congress decision, however, undoubtedly affects Brazilian technological progress. Worse still from our point of view, this decision only strengthens the position of those who, since the days of Ambassador Araujo Castro [former Brazilian ambassador to the United States who supported the exchange of technological information among countries], spoke out against the alleged technological monopoly of the industrialized countries, especially the United States. Now that the sale of the supercomputer to Brazil has been forbidden under the excuse that Brigadier Hugo Piva, retired, has placed his professional services at the disposal of the Iraqi Government, it will be difficult to say that those who support Araujo Castro's theories are continuing to see ghosts.

No matter how disagreeable it may be to occupy the position of the lamb in the fable, the facts are there: The select sectors that decide U.S. foreign policy (and the U.S. Congress is one of these sectors) believe that Brazil does not deserve any confidence. It does not deserve any confidence because, 15 years ago, the "experts" reached the conclusion that Brazil was about to manufacture the atomic bomb at any moment. President Collor de Mello's words are not enough to clear up the mess that started at the time of the Brazilian-German agreement. For the U.S. Congress, the Constitutional guarantees are worth nothing; the Congress control over the military ministries budget is worth less still; the lack of industrial ability to eventually overcome the problems of construction is not a worthy reason either. Still more worthless for the U.S. Congress is the fact that the government has no money to finance a nuclear adventure.

The poor lamb in the fable was devoured by the bad wolf. It is hard for us to believe that a country such as Brazil, with its weighty importance in the continent and its incomparable position in the Latin American political scenario, will have to accept being the passive victim of the bad temper of third parties. We would not like to be forced to oppose the United States and our tradition confirms that this has been our position throughout our history. Nevertheless, we want to find a consistent and determined policy, based not only on integration with Argentina, so that we can make the United States realize that there are alternative ways of treating a government that intends to ensure technical capacitation for its people without having to give up its positions in the domestic field. This is particularly true when this government, headed by President Collor de Mello, has been repeatedly demonstrating its wish to support the U.S. position in whatever aspect that may prove necessary for the consolidation of the new international order.

From now on, Itamaraty has a hard task: It has to build a position in which we will cease to be the lamb of the fable without returning to the outdated ways of Araujo Castro.

Financing for Continuance of FRG Accord Viewed

91WP0016A Sao Paulo *GAZETA MERCANTIL*
in Portuguese 3-4 Oct 90 p 16

[Article by Amarilis Bertachini: "Decision on Future of Accord With Germany Expected in a Few Days"]

[Text] Sao Paulo—Fifteen years after signing the accord with Germany to further its nuclear energy development program, which provided for the transfer of technology relating to the entire nuclear fuel cycle and for the construction of eight nuclear power plants, Brazil finds itself with three other independent military nuclear programs (of the Navy, the Army, and the Air Force) in progress; two of the power plants provided for in the FRG accord partially built but with construction virtually at a standstill; and one power plant, purchased from the U.S. company Westinghouse, that has been in operation since 1983 but with shutdowns so frequent that it has been dubbed the "firefly power plant."

The decision on continuing each of these programs will be taken by the government in the next few days. A report prepared by a working group formed at the outset of the administration of President Fernando Collor de Mello and coordinated by the Secretariat of Strategic Affairs (SAE) contains a complete survey of the energy potential and investment requirements of the next few years pursuant to the official program with Germany and the independent military research projects.

President Collor de Mello has made a point of calling attention to the peaceful orientation that he wishes to impart to the nuclear area.

In his speech opening the 45th general assembly of the United Nations late last month, the president declared that "the Brazil of today has ruled out any plan for a test involving nuclear explosions even for peaceful purposes, and hopes that other countries will consider the possibility of adopting the same course." A few days previously, the president had made a public gesture that was intended to have international repercussions.

With two shovelfuls of lime and a piece of volcanic rock, Collor de Mello symbolically took the first step in sealing the borehole 320 meters deep that had been drilled in the Serra do Cachimbo (in southern Para state) during the 1980's for use in nuclear weapons experiments.

Official Program

The available official information tells only of the plans in connection with the projects now under way for construction of the Angra II and Angra III power plants, each with a capacity of 1,300 megawatts. Completing work on these power plants will require investments totaling \$1.49 billion for Angra II until 1996 and \$1.92 billion for Angra III until 2000 (in direct costs). The structures in connection with Angra II have been virtually completed, and installation of the electromechanical equipment has begun. Approximately 80 percent of the equipment has already been purchased. At Angra III,

only the excavation for the foundations of the plant has been completed, although 70 percent of the equipment has already been purchased. Approximately 70 percent of the equipment for the two power plants is of German manufacture, supplied by Siemens AG. As of the end of last year, \$1.6 billion had been invested in Angra II and \$500 million in Angra III (in direct costs).

In the opinion of Ronald Araujo da Silva, superintendent of safety and licensing for nuclear quality at the federal enterprise Furnas Electric Power Plants, Incorporated, it would be "highly desirable" if the opening of the national market leads to a greater inflow of foreign money to continue the projects. He disclosed that the German financing accounts for less than 50 percent of the total cost of the project. The participation of foreign capital in the Brazilian nuclear program could be provided in various ways, he said, ranging from debt conversion agreements to an increase in the funding from Germany itself, provided this funding is not tied to the supply of equipment, a problem that has already been resolved.

Private Enterprise

Participation in the program by private enterprise could also be an alternative, Superintendent Araujo da Silva declared. The superintendent could, for example, turn the projects over to private enterprise for completion, and a consortium of building contractors and equipment installers could be formed. Another option for actualizing assets would be to create a special fund, based on electric power rates, for completion of the projects.

The superintendent said that if the program is delayed further, the project will become technically unfeasible. Meanwhile, he said, the imported equipment is stored in sheds located at the two plants, at Nuclep [Nuclebras Nuclear Plant Construction, Incorporated], and in Germany, carefully packed and under humidity control. The cost of completing Angra II and Angra III, Araujo da Silva said, is comparable to what would be spent on the construction of a new hydroelectric power plant of the same capacity.

Lindolfo Paixao disclosed that Furnas is spending approximately \$10 million per month to maintain the idle plants.

Venturini To Present 'Nuclear Diary' to CPI

91WP0016C Rio de Janeiro *O GLOBO* in Portuguese
22 Sep 90 p 19

[Text] Brasilia—The Congressional Committee on Investigations (CPI), which is investigating the Brazilian nuclear program, has already scheduled the period during which it intends to examine the "nuclear diary" of General Danilo Venturini, who, during the Figueiredo administration (1979 to 1985), in his capacity as secretary-general of the defunct National Security Council,

was responsible for the program. They will do so between 10 and 15 October, before the members of the committee visit the Aramar project.

The general, who in practice played a role in all the administrations of the military period, will have to disclose, for example, the reasons that motivated Brazil not to sign the nuclear weapons Non-Proliferation Treaty, a position that has not been changed in the Collor administration.

Gen. Venturini yesterday said once again that in compliance with a request from a CPI secretary, he will not disclose in advance the data that he collected during the six years he was in the government. He denied that his decision was intended to avoid any involvement in the controversy over the use of the Serra do Cachimbo for nuclear tests.

"The Brazilian nuclear question," Gen. Venturini commented, "is very broad in scope, and to prepare myself to discuss it I shall complete the documentation. It is not just an internal question. Moreover, the CPI meeting is open to the public," he said.

Despite his refusal to present the data that has been filed away for six years, Gen. Venturini gave assurances that he can offer very important assistance to the members of congress in the CPI. He went on to say that because of the experience accumulated during that period and his vision of the international picture, he is able to analyze the international debate around the nuclear question. The general pointed out that although the research in the nuclear area in Brazil dates back to the 1950's, a clearly defined policy on the nuclear question began to take shape only in 1979.

The general said that in the first two years of the Figueiredo administration he maintained contact with the universities and military units that were conducting research in the area of nuclear technology, and that this had made it possible to unite the efforts of Brazilian researchers. He also said that Brazil had been unable, during those six years, to conclude an agreement with any country providing for participation in research in the field of nuclear energy.

"France, for example, accepted our participation but did not agree to transfer the technology to our staff," Gen. Venturini said.

The general said the reason the government did not sign, in 1968, the nuclear weapons Non-Proliferation Treaty—a document prepared by the United States and the Soviet Union—was the insistence of the countries that dominate research in the area of nuclear technology on keeping Brazil in a state of dependency. He said that the person responsible for Brazil's vote in opposition to signing the treaty was Ambassador Araujo Castro, former minister of foreign affairs in the administration of Joao Goulart (who was deposed by the military government).

Past, Present Activities of Hugo Piva Surveyed

91SM0038Z Sao Paulo VEJA in Portuguese 3 Oct 90
pp 48-50

[Unattributed article: "Scientist of the Arabias"—first paragraph is VEJA introduction]

[Text] Here is the agitated trajectory of Hugo Piva, the researcher who makes missiles for Saddam Husayn and makes the diplomats nervous.

A Brazilian citizen, Hugo de Oliveira Piva, 63, reserved, slender, and soft-spoken, has become accustomed to travel around Baghdad with a boldness permitted only to famous visitors, who are greeted with bowing and scraping by a regime that has unimaginable rigors in store for its adversaries and even for those who are "neutral." A brigadier general in the reserves, he is a friend of major figures in the Saddam Husayn regime such as Generals Ahmed Hubaidj and Ahmet Rashid, high-ranking officials of the powerful Ministry of the Military Industry. When the Persian Gulf crisis broke out and the drama of the foreign hostages began, he set out in a direction opposite to that of everyone else: he was in Brazil and returned to Iraq to extract exit visas for some of his acquaintances in Iraq and their family members. It took one week. Piva also left Baghdad at a time of his own choosing, with a party of 27, and even upstaged the Brazilian diplomats. "I know some rather important persons in that country, and I can free other people as well," he said on this occasion. "But I would not do it on my own initiative."

The general's "performance" in the Arabias did not end there. He returned to Baghdad in early September, and while all the Brazilian authorities were saying that the case of Piva's friends was extremely complex and sensitive, he had another "surprise" to flaunt: the first exit visas to be stamped on passports were those of this group. The group of 21—known as "Piva's Team"—was expected to arrive this weekend in Brasilia together with 230 other Brazilians of various companies who had been detained in Iraq and whose departure was negotiated with difficulty by the special diplomatic mission sent to Baghdad by the Brazilian foreign ministry. An Air Force officer with the rank of major general [as published] (the next to the highest rank in the military hierarchy) and former director of the Aerospace Technology Center (CTA), Hugo Piva was at the center of an embarrassing situation that the Brazilian diplomacy of today inherited from the previous governments and from which it has been unable to free itself.

The confusion had its unobtrusive beginnings in October of last year, when Piva assumed command of a team of high-level engineers, almost all of whom were former government officials, who had been commissioned to develop a missile to equip the Iraqi fighter aircraft. After successive jabs delivered by the Foreign Ministry following the outbreak of the crisis in the Gulf, Piva last week became the target of President Fernando Collor himself. During his visit to the United States, Collor

announced that he intends to draft a bill that will prohibit former government employees from working for other governments. In referring to Piva, Collor deliberately did so in a pejorative manner, calling him "a former brigadier general"—as if there could be such a thing as former doctors or former engineers. His attack was almost a public apology to the United States for the fact that there are Brazilians working for Saddam Husayn.

Thorn in His Side

Persona non grata to the present government, Piva represents the most obvious crack in the Foreign Ministry's Middle East policy during the past 15 years. He insists that he went to Baghdad to make missiles only after getting the green light from the Sarney administration, at a time when Iraq was still being treated as Brazil's principal trading partner in the Middle East and as a nation deserving of official, albeit secret, negotiations. The new administration, however, has demonstrated on repeated occasions that it intends to distance itself increasingly from Baghdad and pass an eraser over everything that might recall the longstanding and special friendship with Saddam. Piva is a thorn in Collor's side. After all, he headed almost all of the "Great Brazil" military projects, which squandered millions of dollars on ideas such as constructing missiles, launching space rockets, and, it is suspected, even exploding atomic bombs. Today, the general has even been trailed by spies in the service of the Brazilian Government, which is trying to learn about his private activities.

First in His Class

"I do not know why there is so much controversy," Brig. Gen. Piva says. "It was the great powers that armed Iraq and even supplied it with chemical weapons factories. We only taught the Iraqis to make a defensive missile, one that is small and simple, similar to those they have already been buying on the market whenever they wanted to," he says, in a reference to a version of the Piranha missile that Iraq had begun to develop with assistance from Brazilian engineers. In signing the contract with the Iraqis, Piva became entangled in a web of espionage typical of spy stories. It is a well-known fact that Piva is the owner of a small company that sells technological consulting services and military projects; his firm, the HOP [Hugo de Oliveira Piva] Company, has its home office in the city where he maintains his residence: São José dos Campos, 100 km from São Paulo. According to Piva himself, it is this company, which occupies a modest room in a downtown office building, that hired the engineers. A secret report sent by the Brazilian Embassy in Baghdad, however, discloses that the general receives the payments for his services through another company he owns, the Benford Holdings Corporation. The Benford management is domiciled in Panama; the Benford home office is registered in Monrovia, the capital of Liberia, in West Africa; and the Iraqi Government's payments are deposited in the Bank of the Netherlands, in Luxembourg. In other words, the

company is ensconced in a network of fiscal paradises that in practice are the easiest way to transmit secret funds, smuggled equipment, and suspicious military projects.

Before entering the reserves, Piva built a brilliant military career. In the Air Force Academy, he stood at the top of his class. A champion on the target range and in athletics, he was an ace pilot and was promoted to the command of a squadron of fighter planes. Upon attaining the rank of captain he decided to enter the Aeronautical Technology Institute (ITA) to learn how to make aircraft. In its 30 years of existence, only eight students have graduated from the institute without ever receiving a grade below 9.5—and Piva is one of them. (Colonel Ozires Silva, minister of the Infrastructure, is another.) Piva also succeeded in distinguishing himself in the United States, where he spent four years in one of the world's most respected universities, the California Institute of Technology, where he received a Ph.D. in Aeronautics and Mathematics with a grade of 10.

Piva speaks four languages, has had nine books published, and regularly gives international lectures. He has participated in a number of projects, including the first Brazilian vertical-takeoff aircraft, the "Convertiplano," in the 1950's; the first Brazilian helicopter, the "Beija-Flor" [Hummingbird], in the 1960's; the first Brazilian rockets, the "Sondas," in the 1970's; and lastly, the first missile to carry the Brazilian flag, the "Piranha," in the 1980's. With a résumé of these dimensions, he has won from his friends the affectionate nickname of the "Brazilian Von Braun," in a reference to the German scientist who invented the V-2 rocket for Hitler and became the father of the American space program. "He is a genius," insists Brigadier General Tercio Pacitti, former rector of the ITA. "The Americans brought Von Braun to the United States, and the Iraqis came to Brazil to get Piva."

Professor Pardal

In addition to the obvious difference in scientific stature, there are other differences between Hugo Piva and Von Braun. The German scientist grew up under Nazism, went to work for the Americans, and accumulated a résumé of projects that were successful. Piva traveled an opposite route: he frequented the high command of the Air Force, even though he did not have the rank to do so; was elected a member of prestigious scientific organizations; and is today a partner in Saddam Husayn's military projects. Another problem with the Piva-Von Braun comparison is that none of Piva's projects was entirely successful. As director of the CTA he undertook projects so grandiose that they became the butt of jokes among his colleagues: one of these projects called for burning tons of petroleum in the open sea to induce a deluge over the semiarid interior region of northeastern Brazil to end the drought there. The rockets of the Sonda series—from Sonda I to Sonda IV—did successfully carry out the meteorological experiments for which they were designed, but the project cannot be considered a total

success. The Sondas were the initial stages of a huge rocket for launching satellites that could be converted into long-range missiles.

The satellite has already been purchased, but the rocket, the VLS, has remained in the prototype stage ever since the Sarney administration cut off its funding. And last, the Piranha missile, an almost inoffensive weapon compared to the top-of-the-line conventional weapons of the great powers, consumed \$10 million and had its appropriations cut off at a time when it needed an additional \$70 million to go into production. After that occurred, Piva decided to try to conduct his experiments in Iraq. "He is a kind of Professor Pardal," explained engineer Vito di Grassi, vice president of Engesa [Specialized Engineers, Inc.] and former president of the Orbita company, which would have built the Piranha. "He is a brilliant scientist, but as a manager he leaves a lot to be desired: he never finishes a project as it was conceived and always wants to change something."

Atomic Bomb

Among the projects that Piva attempted at the CTA was one that was especially controversial—the "Solimoes"—which called for drilling the borehole for atomic tests in the Serra do Cachimbo that President Collor sealed two weeks ago. According to a four-star brigadier general who is a former member of the Air Force high command, the idea was not to drill just one borehole but four or five. The project also called for the explosion of nuclear devices as part of the "parallel program" carried out by the Armed Forces beginning in the 1970's. Piva took over the project at a time when the first borehole was almost ready, but tried to arrange for it to have an unusual outcome. Toward the end of the Figueiredo administration, when it had become obvious that the opposition would inevitably win the presidency, he was invited to take part in a meeting of the high command to discuss the nuclear program.

According to one of those who were present, Piva suggested at the meeting that two decisions should be made before the Figueiredo administration turned over the reins of government. The first would be to launch a Piranha missile, for which there already was a prototype. The other would be to conduct a nuclear test in the Cachimbo borehole. There were many objections to the latter idea. It was pointed out that nearby groundwater might be contaminated. The idea ultimately wound up in the wastebasket for an even more compelling reason: the atomic bomb would still not be ready, and no one was able to say with certainty when or if it could be detonated.

Wine and Jail

Brig. Gen. Piva had already entered the reserves (in 1987) before this occurred. The then minister of Aeronautics, Moreira Lima, was an old adversary and insisted on denying him his fourth star. "He was not promoted," Moreira explained, "because he is not a team player and

was inadequate as an administrator. No one can deny that Piva is brilliant, but he is an extreme individualist: he did as he pleased, and no one had the courage to contradict him." During the years he was in the CTA, Piva was a source of controversy. As an administrator he specialized in finding shortcuts within the bureaucracy to enable him to embark on his projects, and he became familiar with all of the black markets abroad where one could buy quantities of components that were banned by the great powers. On one occasion his superior in the CTA vetoed the purchase of a supercomputer; some months later the computer arrived, already purchased. On another occasion he was forbidden to use project funds to give salary increases to the researchers; the corresponding checks were subsequently revealed to have been "raised," and he spent several days in jail.

Piva is an unusual person in his private life as well. His father was a wealthy rancher in Brotas, in the interior of the state of São Paulo, and Piva today lives quite comfortably. He owns land and commercial real estate in São Paulo and in São José dos Campos, and lives in a duplex near the CTA. Self-disciplined to an extreme, he eats basically cereal grains and vegetables, sleeps no more than five hours a night, and has only one hobby: wines. Piva founded and heads, in São José dos Campos, the Brotherhood of the Friends of Wine and Oenology, and enjoys taking part in ceremonies in which he can distinguish, with his eyes closed, a Bordeaux wine from a Burgundy, and on a number of occasions has even identified the vintage. "His conversation is pleasant, and he dominates our meetings," comments Dominique Contant, vice president of the Brotherhood. This past weekend, when the Foreign Ministry was hoping to consummate the dramatic departure of the Brazilians from Iraq, it was this Brazilian citizen, Brig. Gen. Hugo de Oliveira Piva, who was at the center of one of the most distressing diplomatic embarrassments in which the nation has been involved in recent years.

Differing Views Toward Bomb, Program Expressed

9/WP0010A Rio de Janeiro MANCHETE
in Portuguese 6 Oct 90 pp 108-111

[Article by Helio Conteras: "Atomic Brazil: The Bomb Without Mysteries"—first paragraph is MANCHETE introduction]

[Text] Brazil has already said it does not want the bomb but does want full access to nuclear technology.

The plain truth is that if it wishes, Brazil is able to make an atomic bomb within a short period of time. It already possesses the most difficult ingredient—the technology—and the fuel is not lacking. The problem is money (the project is extremely expensive) and, above all, the desires of the Brazilian people, including the government, congress, the scientific community, and the armed forces. At the present time Brazil has no plans for production of the bomb—and there is general agreement

that it is better that way, because the first victim of the Brazilian bomb would be our own country, which would have to pay a political price much higher even than the monetary price.

The controversy over the use of nuclear energy in Brazil—a controversy that has often had colonialist overtones—was stimulated by the atmosphere of secrecy surrounding the issue and by decisions taken in private. This is particularly true of the contentious nuclear power plant at Angra dos Reis—Angra I—which is based on a ready-made technological package sold by the U.S. Westinghouse company and approved by the National Security Council at the end of the decade of the 1960's.

Although criticized by sectors associated with the defense of the environment, the participation of the military in the autonomous nuclear program led to mastery of the process for the enrichment of uranium, thus enabling Brazil to produce radioisotopes needed for the control of a number of diseases such as cancer, thyroid problems, gastritis, heart disease, and others.

On the subject of the bomb, public opinion can be summed up in the individual opinions of two military officers. The former minister of the Navy, Admiral Maximiano da Fonseca, once again says (as he has been saying since the time he commanded the Navy) that he is in favor of the explosion of a Brazilian atomic bomb to strengthen the nation's independence. The chief of the Strategic Studies Group of the University of Campinas, Army Reserve Colonel Geraldo Cavagnari, is emphatic in stating his position. "Before making plans for a strong defense industry and an atomic bomb," he says, "a decision which actually should be made by the entire Brazilian community, Brazil has to improve the standard of living of its people."

The initial steps in connection with the atomic bomb project were taken during the "Brazil-World Power" era through the instrumentality of the National Service for Intelligence and the former National Security Council. The fact is that these steps reflected not only fantastic projections of Brazilian reality but a certain megalomania. The military regime's intention to make the bomb did not remain in the category of a mere romantic dream. It led even to the drilling of a borehole—300 meters in depth and 1.2 meters in diameter—at the Cachimbo Air Base in southern Para for nuclear weapons tests. The borehole required an investment of millions of dollars (the total amount was not disclosed, because it was a secret project) and was symbolically plugged by President Collor last week with a shovelful of lime. By this gesture Collor sought to tell the world that Brazil does not want the bomb.

One of the concerns of U.S. authorities is the possibility that nuclear technology could be transferred from Brazil to countries classified by the State Department as "unstable and not committed to world peace," among which the Americans include Iraq and Libya. Another

factor, however, that greatly disturbs the State Department analysts is the consistent refusal of the Brazilian Government (ever since Costa e Silva in 1967) to sign the Nuclear Weapons Nonproliferation Treaty. For their part, Brazilian authorities argue that the United States, the Soviet Union, and other lesser powers are attempting, by this treaty, to prevent developing countries from having access to high technology.

The Autonomous Nuclear Program, developed by the National Commission for Nuclear Energy and the Navy, is not subject to inspection by the International Atomic Energy Agency [IAEA], in contrast to the nuclear program based on the agreement that Brazil signed with Germany in 1975, which is. It was the Autonomous Program that enabled Brazil to master the technology for enriching uranium and thereby to have access to the very exclusive "Atomic Club."

Seated near a telephone over which he is able to communicate directly with President Collor, one military analyst comments from his office in Brasilia that the important thing is not to buy technology but to develop it. "The nation that has not mastered, by the year 2000, the technologies required for nuclear and space development and for development in the fields of electronics, informatics, and advanced chemistry will be unable to consider itself independent."

Until it achieved mastery of nuclear technology, Brazil invested in a number of institutions that included nuclear technology among their priorities. The Aerospace Technology Center at the end of the decade of the 1970's became involved in research looking toward the development of nuclear technology by means of lasers, but in actual fact the most distinguished officer at the Center, Brigadier General Hugo de Oliveira Piva (who is currently involved in an air-to-air missile project for Iraq), left no doubt that his priority was space research.

The military ministers—Mario Cesar Flores, General Carlos Tinoco Ribeiro Gomes, and Brigadier General Socrates da Costa Monteiro—are themselves proof that times have changed. But despite the fact that the three cabinet ministers have already made it clear that they favor the civilian and peaceful use of nuclear energy, even the Autonomous Program itself, in which the Navy participates, is now under the authority of the Secretariat of Strategic Affairs. By way of compensation, it is in the Collor administration that the nuclear sector is for the first time under civilian control. It will be important, in the view of representatives of the scientific community, that these civilians display an attitude as civilian-oriented as that of the cabinet minister who is influential in a nuclear program: the minister of the Navy. The Navy, incidentally, intends to take advantage of the development permitted under the Autonomous Program in order to have its first nuclear submarine by the end of this century (or early in the next). For the alarmists, an explanation is in order: the International Atomic Energy Agency does not regard the use of nuclear propulsion in submarines as a military use of the atom. A respected

Brazilian political scientist who remained resolutely in the opposition during the entire military regime, Professor Helio Jaguaribe, says there is a difference between nuclear weapons and nuclear submarines, thereby endorsing the IAEA's concept.

In the military area, there is another project of great importance in terms of technology: the Experimental Radiation Reactor, developed by the Army's Technological Center, which is headed by General Romero Lepesquer, a general of the civilian tradition who is regarded as one of the most distinguished career officers and who has always adopted a more open posture with regard to the Brazilian community as a whole. The project could result in the inclusion of Brazil among those countries that have mastered graphite technology in the nuclear area, in which that element is used as a moderator. Everything indicates that the quest for nuclear know-how is not going to be aborted, for the atomic question in Brazil is truly a powerful "chain reaction."

No Plans Made To Manufacture Atomic Bomb

PY2110233290 Rio de Janeiro *Rede Globo Television in Portuguese* 2300 GMT 19 Oct 90

[Text] Brazil has the capability of making nuclear fuel, but the government guarantees it will not manufacture an atomic bomb.

This information was confirmed today during a visit by a Chamber of Deputies investigation committee to the Navy Nuclear Research Center in Ipero, Sao Paulo State.

The Navy Nuclear Research Center began work secretly 12 years ago. Its work became public in 1987, but the secrecy continues. During the congressional committee's visit today to investigate the Parallel Nuclear Program, foreign journalists were prohibited from access to the center, but Brazilian reporters were able to enter the installation without photographic or television cameras.

The congressional committee was able to see the entire Navy nuclear structure in Ipero, 120 km from Sao Paulo. The committee verified that the Navy is developing the construction of reactors for future use in nuclear submarines and has the technology for uranium enrichment. The congressional committee's deputies and technicians were very impressed with the Navy's advanced technology, which is by far the most modern in the country in the nuclear field.

The committee members, who are concerned with the military use of that technology, were told the truth about a fact that has never been officially admitted. The Navy officers said that after the technology for uranium enrichment has been obtained, a bomb can be made, but the government does not plan to make it. Brazil can manufacture an atomic bomb if it wants to.

[Begin recording] [Luis Pinguelli Sosa, congressional committee adviser] The atomic bomb is a very serious thing, making one would be against the country.

[Jose Goldemberg, science and technology secretary] What happens with uranium enrichment is what happens with many other things like steel, for example, which can be used to make either a knife to cut bread or a cannon. The problem for civilian society and for the government is creating mechanisms to maintain control over the use of nuclear installations to prevent them from being used for nonpeaceful purposes. The government is going to comply completely with constitutional regulations in this regard. Nuclear energy in Brazil will be used exclusively for peaceful means. [end recording]

Deputies Learn Source of Enriched Uranium

PY2510021490 Rio de Janeiro *Rede Globo Television in Portuguese* 2200 GMT 24 Oct 90

[Text] After remaining secret for nearly 20 years, the parallel nuclear program is beginning to be revealed. The Congressional Investigative Committee, CPI, charged with investigating this program is now inquiring about the source of the nuclear fuel being used by a Brazilian Navy nuclear reactor.

This reactor, which was built by the Navy with the University of Sao Paulo, is a very important part of the Brazilian parallel nuclear program. It is considered a small reactor. It has only 100 watts, but it is essential for nuclear research activities.

Although the equipment is experimental, it uses the same nuclear fuel as an industrial reactor: enriched uranium. An investigation of the source of this fuel began last Friday when the deputies serving on the CPI visited the Navy's Aramar nuclear plant.

Since it went into operation in 1988, this reactor has used 220 kg of enriched uranium, which has never been produced by Brazil. For instance, the enriched uranium for the Angra nuclear plant has been imported in its entirety and cannot be used anywhere else. To do otherwise would be to violate the law and international agreements.

In reply to the CPI members, Admiral Otto Pinheiro da Silva, who is responsible for this project, said he does not know where the uranium came from. Similarly, Luiz Santana, chairman of the state-owned organization charged with overseeing the entire Brazilian nuclear program [National Commission for Nuclear Energy, CNEN], could not tell the deputies who supplied the enriched uranium.

The Brazilian Congress has already learned the name of the country that supplied enriched uranium for the Brazilian nuclear program. The secret was revealed by two former coordinators of the Brazilian nuclear program during a secret session held today at the Chamber of Deputies in Brasilia. This information is being kept top secret.

Even advisers of deputies and senators had to wait in the halls. Behind well-guarded closed doors, only the members of Congress could hear the testimonies of General Danilo Venturini, former secretary-general of the National Security Council, and of Rex Nazare, former chairman of the CNEN. The CPI members asked these two former officials about the origin of the enriched uranium for the Aramar Experimental Center in São Paulo.

The Federal Constitution now bans any nuclear experiment without the approval of the National Congress.

[Begin recording] [Deputy Ana Maria Rattes, chairperson of the CPI on nuclear energy] For the first time, members of Congress have had access to a still carefully guarded state secret.

[Reporter] But the secret was disclosed only to congressmen.

[Rattes] Only to congressmen. It was done this way for security reasons and to keep our international commitments. We should continue to do so.

[Gen. Venturini] We had agreed to keep this information secret, but we cannot deny it to Congress. Today, Congress controls this program. [end recording]

Tecmat To Produce Nuclear Pure Graphite

91WP0016B Rio de Janeiro *O GLOBO* in Portuguese
22 Sep 90 p 19

[Text] The nuclear pure graphite necessary for the Experimental Radiation Reactor (REI) that will be developed by the Institute for Special Projects (IPE) of the Army Technological Center (Cetex) at Guaratiba, Rio de Janeiro state, will be produced by the Tecmat company, located in Nova Iguaçu. This reactor, which is powered by metallic uranium, is air cooled, and will be able to produce approximately 400 grams per year of plutonium (the material used in the bomb), will require 500 tons of pure graphite in order to function as a moderator of atomic reactions.

According to its management, Tecmat is following a policy of not providing any information concerning its contracts. We know, however, that the company is part of the Microlab group, was created a year ago, and is the first company in Latin America to produce nuclear pure graphite, thereby making Brazil the seventh country in the world to master this technology, which was developed jointly by the company and the Army.

Tecmat also provides this product for steel mills, foundries, and automobile industries, which use it in electrodes for air-cooled electric furnaces.

This is not the first time that the so-called Independent Nuclear Program has formed a partnership with private enterprise in the development of sensitive technologies. The National Commission for Nuclear Energy (CNEN),

for example, has an agreement with the Brazil Peroxides company of Curitiba, Paraná state, for the production of heavy water.

Research was initially conducted with respect to this technology in the 1960's by experts of the Military Engineering Institute (IME). The heavy water can be used in natural uranium reactors (such as those of Argentina), in the controversial experiment in cold fusion, and as a source of special hydrogen (deuterium) in hydrogen bombs.

Origin of Cachimbo Hole Construction Discussed

91WP0012A São Paulo *VEJA* in Portuguese 26 Sep 90
pp 41-42

[Unattributed article: "Plugging the Hole"—first paragraph is *VEJA* introduction]

[Text] Collor seals off a borehole intended for nuclear tests and exposes the military nature of the parallel program.

Most Brazilians have always heard that there was a hole in the government's spending and, of course, always understood this assertion in a metaphorical sense. Last week it was discovered that during the past several years the machinery of the Brazilian state was in fact capable of throwing money into a real hole, one 320 meters in depth and 1.20 meters in diameter and lined with a complex alloy of steel and cement—at a price of one million of the dollars of that day. It was this borehole, drilled in the Serra do Cachimbo, in southern Para state, that President Fernando Collor decided to seal off last Tuesday by pouring two shovelfuls of lime down into it, in a gesture made at just the right moment for the head of state, who this Monday will be in New York to deliver the opening address before the UN General Assembly.

"Plugging this hole puts an end, in the most unambiguous way possible, to the speculation that Brazil wants to make nuclear bombs," declares the physicist José Goldemberg, secretary of science and technology, who was present at Tuesday's ceremony. Completed in 1984 during the administration of Joao Figueiredo, the Cachimbo borehole is one of the most conspicuous examples of the alliance between militarism and the waste of public funds. The fact that the borehole was intended for tests of nuclear explosives had long been suspected, but not until last week had anyone in government acknowledged that intention officially. "This would be the only conceivable reason for drilling the hole," declares Secretary Goldemberg, who is one of Brazil's leading authorities in the field of nuclear physics. As of the present moment, however, it is not known why, or how, the borehole was constructed.

A Different Era

It was disclosed last week that construction of the borehole was begun in 1980, at a time when Brazil had not mastered even the atomic cycle—that phase of the

scientific research during which all the steps in the process leading to the production of nuclear energy are successfully replicated in the laboratory. As is known, this phase was not completed until seven years later, during the administration of President Jose Sarney. But if in 1980 Brazil had still not produced nuclear energy even in the laboratory, why construct a cylinder to be used for testing explosives in view of the fact that no one knew when these explosives would be ready? According to one official who at that time held a privileged post from which to observe the clandestine atomic activities of the government, no nuclear experiment was in prospect even though the ministry had plenty of money. It was then decided to construct the borehole in any case. To this end, approval was obtained from all the organs having jurisdiction—the National Security Council; the Ministry of Aeronautics, during the tenure of Minister Delio Jardim de Mattos; and even the Presidency of the Republic—and the project was initiated under the supervision of Colonel Reginaldo Santos of the Technological Center of the Ministry of Aeronautics at Sao Jose dos Campos, 97 kilometers from Sao Paulo. "Everyone was convinced that there was no time to lose in this area," the aforementioned official said.

"This borehole," Secretary of the Environment Jose Lutzenberg insists, "which was intended for use in atomic experiments, is the product of a different kind of thinking, of a different era." Accompanied by Jose Goldemberg, on Friday 14 September Admiral Othon Pinheiro da Silva, chairman of the Navy's coordinating committee for space projects, took part in a conference at the University of Sao Paulo. Speaking to an audience of physicists who systematically denounced the militaristic plans that motivated the government's nuclear research, Admiral Othon made a presentation on the subject of the Cachimbo borehole and explained in detail the nature of the nuclear tests that were to be conducted there. "At that time," the admiral said by way of justification, "what was being planned was not prohibited." This was a reference to Article 21 of the Constitution, which stipulates that Brazilian nuclear research is to be carried out solely for peaceful purposes.

In sealing off the Cachimbo borehole, the president was sending a very clear signal with respect to his views on the nuclear question. Collor simply believes this is a matter that does not belong on any list of priorities for a nation with such an enormous burden of urgent problems as Brazil. But one unanswered question remains: what will happen with respect to the nuclear research carried out by the three branches of the Armed Forces from this day forward? In the Navy, where an attempt is being made to enrich uranium by a traditional method called centrifugation, an enrichment of 20 percent has already been achieved; to produce the bomb, this figure must surpass 90 percent. The objective of the research carried out by the Ministry of Aeronautics is to obtain this enrichment by means of laser beams, and the Army is working on a project for building a graphite reactor.

A Sad Fate

The experts in this field view these activities differently. Secretary Jose Goldemberg, for example, believes the Navy project is of undeniable scientific value, inasmuch as its purpose is to develop a submarine that for propulsion will use atomic energy instead of conventional fuel. Goldemberg also believes that the laser research carried out by Ministry of Aeronautics officials at Sao Jose dos Campos is justified by the fact that this type of energy can, for example, be used by satellites. The secretary takes a dim view of the Army's research, however, first because no conventional activity in that branch of the service requires nuclear energy, inasmuch as there are not even any nuclear-powered tanks being manufactured. Another problem is the fact that graphite reactors are the best known medium for producing plutonium—the favorite material for those who plan to make an atomic bomb. "It is difficult to justify this project," Goldemberg insists, "because no one knows in what way a reactor of this type would meet the specific needs of the Army."

A perfect example of the technological advances that enable government officials to undertake megalomaniacal projects at the expense of the taxpayers, the Cachimbo borehole has met a sad fate. Not having any use for the installation, no one took the trouble to put a cover over the site, with the result that because of the rains, the level of water last week reached a height of 140 meters and much of the cylinder is now rusted. Now that President Fernando Collor has emptied two shovelfuls of lime into the borehole, work will begin on plugging it. The original plan was to fill the hole with dirt, but last week concrete was deemed to be more suitable for the purpose. A total of 100 trucks, loaded to the brim, will be required for the task.

Cachimbo Closing Fails To Allay Suspicions

91WP0018A Sao Paulo ISTOE SENHOR in Portuguese
26 Sep 90 pp 23-24

[Text] On Tuesday, 18 September, several minutes after tossing two shovels of lime into the well built for nuclear tests in the Cachimbo mountains, President Fernando Collor commented to one of the members of his entourage: "Those guys are nuts. They really were going to set off the bomb. That is absolutely true." The outburst capped the official acknowledgement, made the day before, that the well, 320 m deep and 1.2 m in diameter, drilled at the air base in southern Para State between 1984 and 1986, really had been intended for nuclear testing. This confirmed charges leveled in recent years by scientists, politicians, and the press that the Armed Forces were getting ready to build an atomic bomb, a project that was the topic of last week's ISTOE SENHOR cover story.

Both the president's decision to admit the existence of the nuclear military project and his act of symbolically

burying it come at a time when domestic and international pressures are mounting as a result of the disclosures about the technological cooperation between Brazil and Iraq, and on the eve of Collor's trip to New York to attend the opening session of the UN General Assembly this Monday. The shovelfuls of lime did not, however, lay to rest the issue of the militarization of nuclear energy activities in Brazil. Even the threat of a Brazilian bomb still persists, despite the assurances that Jose Goldemberg, the government's secretary of science and technology, attempted to transmit when he said that Collor's gesture "puts an end to speculation that Brazil plans to test nuclear devices."

In commenting on the potential repercussions of the president's policy, physicist Luiz Pinguelli Rosa, of the Federal University of Rio de Janeiro, said that "the value of the symbolic act in the Cachimbo mountains will be confirmed only if the administration permits civilian control over the nuclear program." But any new step toward demilitarizing the program may meet with resistance. The bulk of the nuclear projects are still being directed by the same people who knew about the military objectives, but always denied them. The key figure among these is Rear Admiral Othon Luiz Pinheiro da Silva, in command of the complex at Aramar. At least two ministers in the Collor administration, aeronautics minister Brigadier General Socrates da Costa Monteiro, and head of the Armed Forces General Staff (EMFA) General Jonas de Moraes Correia Neto, showed themselves to be committed to that pact of silence when they withheld information on the well at Cachimbo when it was requested in May by the National Congress. Now they are being sued for abuse of authority by Sao Paulo Deputy Fabio Feldmann (PSDB) [Brazilian Social Democracy Party].

One detail that indicates that Collor's decision to seal the well provoked at least some discomfort among the military leaders was the fact—which did not go unnoticed by members of the group that accompanied the president to Cachimbo—that the three military ministers and the head of EMFA did not accompany the president to the site of the well. Although they had been invited to join the entourage, they remained sufficiently far away from the president to remain out of range of the TV cameras and photographers who recorded the episode.

On the chess board where the pieces of Brazil's nuclear game are being moved, it would appear that the influence of Secretary Jose Goldemberg is growing. He was once one of the leading critics of the lack of transparency in the parallel program. Now part of the administration, he has backed the nuclear projects being conducted by the military research institutes. The science and technology secretary espouses a position somewhere between military trusteeship of the program and the establishment of civilian control along the lines proposed by Professor Pinguelli and endorsed by the Brazilian Society of Physics. To Goldemberg, "it is not necessary that the National Congress exercise technical control over nuclear activities." According to the secretary, that

authority could remain with the Executive, maybe even right in the office of the President. Pinguelli calls this idea "ineffective." He says, sarcastically, "That is the same as asking a child to be responsible for the candy jar."

Unofficial information with respect to the future of the nuclear program suggests that President Collor is inclined to keep all the activities "on the back burner," at least until early 1991, as the only way to try to obtain legitimacy for his nuclear activities and so to ensure the funds to continue them.

CHILE

Government Orders Investigation Into FAE

Defense Minister's Statement

PY1810211490 Buenos Aires NOTICIAS
ARGENTINAS in Spanish 1955 GMT 18 Oct 90

[Text] Santiago, 18 Oct (AFP-NA)—Defense Minister Patricio Rojas reported in Santiago today that Chile does not have chemical weapons and that Patricio Aylwin's government has ordered an "in-depth" investigation into the alleged shipment of a high-power Chilean bomb to the Persian Gulf.

The FAE [fuel-air explosive] bomb is not included in Cardoen Armament Industry's production plans, the private company said on 15 October when denying reports from London charging the firm with manufacturing this type of minor atomic bomb [as received] for sale to Iraq through Libya.

The charges were also denied by the Libyan Government on 16 October. Peruvian Defense Minister General Jorge Torres, however, viewed the news with "great concern," while Bolivian Defense Minister Hector Ormachea accused Chile of starting "a nuclear arms race."

Peru is currently holding talks with Chile on reducing military spending, while Bolivia severed diplomatic relations with the former Chilean regime of General Augusto Pinochet 12 years ago when its efforts to obtain a Pacific Ocean sea outlet failed.

The concern of both nations increased with a report from Buenos Aires saying that Foreign Minister Domingo Cavallo mentioned Chilean "war prowess" and the development of chemical weapons.

Argentine Ambassador to Santiago Oscar Spinoza denied yesterday that Cavallo had made such remarks, adding that there are no "contingency war plans" that include Chile and Argentina.

The Chilean defense minister said today that according to information gathered by organizations that supervise the Armed Forces, Chile is not carrying out any tests or programs with chemical weapons.

As for the private weapons industry, particularly Cardoen, the minister said an "in-depth investigation," which "will clearly determine that nothing of the kind exists," will conclude this week.

The investigation will also establish whether Cardoen is still operating in the Persian Gulf region. In recent years, before the end of the Iraq-Iran war, Cardoen supplied cluster bombs to Iraq.

Foreign Ministry on Reports

*PY1910003890 Santiago Domestic Service in Spanish
2200 GMT 18 Oct 90*

[Text] The government has categorically denied that the state or any of its civilian or military organizations have manufactured or stored high-power chemical bombs or similar weapons. This was revealed a few minutes ago by Foreign Minister Enrique Silva Cimma through an official Foreign Ministry communique as follows:

In view of reports by foreign journalists that Chile or its military institutes have manufactured or stored powerful chemical weapons similar in power to nuclear bombs, which would tilt the Armed Forces balance of power in our favor when compared to that of our neighbors, the Foreign Ministry is duly authorized by the president of the Republic to state:

1. It is categorically denied that the state or any of its civilian or military organizations have manufactured or stored war materiel of the nature indicated.

2. In the event that private companies which manufacture weapons were found to be producing or researching to produce such weapons, or in violation of current legislation on the matter, the government, through the Defense Ministry's supervisory organizations, which are carrying out an investigation, will immediately implement the appropriate corrective measures.

The official Foreign Ministry communique concludes by saying that in any case, national manufacturers of war materiel have emphatically and publicly denied producing bombs such as those mentioned.

Official Denies Manufacture of Atomic Bomb

*PY2010152890 Madrid EFE in Spanish 0150 GMT
20 Oct 90*

[Text] Lima, 19 Oct (EFE)—Chilean Foreign Ministry Under Secretary Edmundo Vargas Carreno stated today that Chile is not manufacturing atomic bombs and is not economically or scientifically prepared to do so.

"I want to categorically deny that Chile is manufacturing or storing chemical or nuclear weapons. It has never done so and will never do so," he said.

"Chile is essentially a peaceful country with very high moral standards; we have never manufactured that type of weapon (atomic), which is forbidden," the foreign under secretary stated.

Terming reports that his country "is manufacturing nuclear or chemical weapons, or similar ones" as "false information," Vargas said Chile has renovated obsolete war materiel "with no desire for an excessive acquisition of weapons."

Foreign news agency reports published in Lima on Saturday [13 October] stated that, according to the Santiago newspaper LA EPOCA, the Chilean enterprise Cardoen is developing a "Fuel-Air Explosive" (FAE), which is as powerful as a tactical nuclear bomb.

"I think the reporter who wrote that article is absolutely misinformed. It is absolutely groundless. The accusation is false," Vargas said.

The fifth meeting of the Peruvian and Chilean Air Force chiefs of staff ended last Thursday in Lima. These meetings are held in accordance with an agreement to maintain good bilateral military relations.

Air Force 'Emphatically' Denies Testing Bombs

*PA2410000290 Santiago Domestic Service in Spanish
2200 GMT 23 Oct 90*

[Text] The Public Relations Department of the Chilean Air Force [FACH] has emphatically denied that C-101 fighters or any of its other planes have tested FAE [fuel-air explosive] bombs, which are known in Chile as BEAC [bomba explosiva aire combustible].

The denial refuted a report received from Spain through international press agencies stating that these planes had tested FAE bombs in the northern part of Chile, in conjunction with Cardoen Companies.

The Public Relations Department explained that the FACH has not conducted tests at any of its proving grounds, nor used any of its planes for this purpose. The source also reported that the FACH has not conducted a joint test with Cardoen Companies for many years.

The FACH spokesman said that the technical characteristics of the FAE bomb, such as weight, diameter, and length, are completely unknown to the institution, and, therefore, it can hardly be said that these bombs have been tested by C-101 fighters, which, in addition, have a very small capacity.

PERU

Fund Shortage Threatens Nuclear Center

*PY2510202190 Lima EL COMERCIO in Spanish
20 Oct 90 p A-9*

[Text] The Huarangal Nuclear Center has been producing radioisotopes since March 1990. Radioisotopes are radioactive substances that are used as tracers in medicine, industry, and mining.

The center meets 80 percent of the demand in Lima, and it will soon meet the needs of Trujillo. Radioisotopes were previously imported from Argentina and Brazil.

Frigate Captain Jose Dellepiane Massa, retired, the president of IPEN [Peruvian Institute of Nuclear Energy], has said that "the reactor is not working to capacity. It could supply the whole of Latin America. To meet the Peruvian demand for radioisotopes, the center operates eight hours per day, twice per week, with seven megawatts. The reactor can produce 10 megawatts."

Dellepiane said that the prices are based on the international market. He said: "We cannot charge more than international prices, even if they represent a loss."

He stressed that to be economic, the reactor should run at more than 50 percent of its capacity. To this end we are trying to sign contracts with private companies under which they bring their technology and their scientists to our center. We will provide the infrastructure and the equipment.

Under this plan, which would be an immediate solution to the crisis faced by IPEN, the reactor time would be divided among activities to meet the needs of the country (20 percent), activities to repay the agency's debt through the rendering of services (30 percent), and activities by local or foreign private companies (50 percent).

One may wonder whether the demand in Peru justifies the operation of a sophisticated nuclear technology center. The answer is apparently no, and the national industrial sector provides a good example. Dellepiane Massa said that previously no one wanted to use radioisotopes for gamma radiography and industrial radiography.

He added: "Other countries have found that improving the quality of their product has promoted a change in the mentality of some sectors. This accounts for the current, albeit insufficient, demand."

The "Oscar Miro Quesada de la Guerra-Racso" Huarangal Nuclear Center, the country's largest scientific and technological investment—\$110 million—is running the risk of becoming paralyzed because of the lack of resources that it receives from the Treasury and because of the withdrawal of a considerable number of nuclear technicians.

During a roundtable meeting with a team of EL COMERCIO journalists, Dellepiane Massa said that a \$3-million annual budget is necessary to operate a center of this kind. "If no financial resources are obtained within a year, Huarangal will be unable to continue to operate. At present we are receiving so little that we cannot even provide our technicians with the essentials for their work," he said.

The future of the center is certainly not promising at all, considering IPEN's \$800,000 debt to the International Atomic Energy Commission.

Fewer Nuclear Technicians

The reduction of the number of nuclear technicians is another major problem for IPEN, which today has 598 employees, 50 percent of whom are working at the Huarangal Nuclear Center.

"Many technicians have left not only IPEN but also the country because working conditions and remunerations are not attractive. A top salary of just 26.5 million intis [time span not given] was introduced for IPEN personnel as of August 1990. It costs more to keep a technician in Peru than it does to train a new one."

Dellepiane admitted that all these difficulties have hindered the operation of the center, adding that the only solution is to make it more profitable. "We are dedicated to the promotion of science and technology. Even though the nuclear center is not an enterprise, it must be managed as an enterprise to guarantee its operation and its use as an instrument for development. We have the necessary equipment," the IPEN president said.

The lack of finances can be immediately resolved by rendering services in the areas of nutrition, agriculture, medicine, industry, and mining.

Offering these services on the local market, however, requires a change in the mentality of the people. They must be encouraged to see nuclear technology as an instrument for development. "The people should understand that nuclear centers are not necessarily linked with nuclear weapons. We are engaged in scientific research, and our main objective is to use nuclear technology to improve the quality of life," Dellepiane said.

The business sector can become the main consumer for the services offered by Huarangal, and the private sector can have access to scientific procedures that will help improve quality and increase profitability and competitiveness in the international market.

INDIA

World Scientists Interested in Bhabha Tritium

91WD0070A Bombay *THE TIMES OF INDIA*
in English 17 Sep 90 p 22

[Article: "BARC 'Cold Fusion' Arouses Interest"]

[Text] Bombay, Sept. 16 (PTI)—The enormous and impressive data of tritium production by Bhabha atomic research centre (BARC) has aroused the interest of scientists all over the world for the first time in the "cold fusion" experiments conducted here.

A year ago, BARC showed tritium to be a consistent primary product of cold fusion reaction. BARC experiments constitute an elaborate series of experiments carried out in a single laboratory with participation by experts from various fields, including physics, electrochemistry and chemical engineering.

The chairman atomic energy commission, Dr P. K. Iyengar, who also heads cold fusion experiments of BARC, said that their expertise in tritium counting, gained by operating heavy water reactors, has helped them to have an edge over other labs in the world. Recently several leading labs have also confirmed BARC's results.

He said, "Further research in this area will shake the very foundations of energy production by fusion reaction as constituted by scientists at present."

A 62-page experimental results of the work carried out from April to September 1989 at BARC by over 50 scientists and engineers was published in August 1990 issue of "Fusion Technology", the journal of the American nuclear society.

This has created vast interest among global scientists, who have written numerous letters wanting further details of the work carried out by BARC personnel, Dr Iyengar said.

While conventional nuclear physics of hot fusion demands equal probability for neutron and tritium production, cold fusion has produced 100 million times more of tritium. "This is the crux of the matter leading to disbelief and conflict among scientists in accepting this new phenomenon", he said.

So far, there has been no satisfactory theory which could explain this anomalous result. Some scientists even question the validity of the nuclear reaction mechanism based on the quantum theory to its applicability at room temperature as in cold fusion, he said.

Cold fusion (deuterium-deuterium) reaction is more like a fission reaction, unlike plasma fusion with deuterium-tritium reaction, which essentially needs a blanket, says Dr M. Srinivasan, the head of neutron physics division of BARC who is also the coordinator of the cold fusion experiments.

This long-term objective of plasma fusion (tokamak), namely aneutronic condition, suddenly seems to be dominated by cold fusion, which promises to enable building fusion reactors based on aneutronic power (energy). Now it is only a question of controlling and scaling up."

Asked about the acceptance of this new phenomenon of cold fusion, Dr Iyengar said there are several instances in which new experimental data not explainable by established theories have shaken the confidence of traditional science.

Quoting the discovery during the early eighties in biological sciences, he said Dr J. Edwin Blalock of Texas University medical branch at Galveston found a human biological molecule where it was not supposed to be and that molecule was adrenocorticotropic hormone (ACTH). He found it in the immune system and that ACTH was made by white blood cells. According to every medical text book of the time, this hormone was made only by the pituitary gland in the brain and belonged to the endocrine system.

Only recently this finding has gained some acceptance after first being labelled as misfit molecule. Now biologists believe there is a need for some rethinking on long-cherished principles.

"One wonders if cold fusion has opened up a similar scenario in nuclear physics," Dr Iyengar said.

IRAN

Paper Urges Germany To Complete Bushehr Reactor

LD1810182190 Tehran IRNA in English 1108 GMT
18 Oct 90

[Text] Tehran, Oct. 18, IRNA—A morning daily Thursday deplored that failure of the German government to fulfill its commitments toward Iran with respect to Bushehr nuclear reactor, "will have negative impacts on the two countries long-run trade ties." The English-language 'KAYHAN INTERNATIONAL' said that the now half-built Bushehr nuclear plant with a total capacity of 1,200 megawatts of electricity had to be completed in 1981 and so far Iran has paid the German contractor U.S. dollars four billion.

The editorial stressed that Iran, a signatory to the non-proliferation treaty, "will never violate international agreements on the peaceful application of nuclear energy." For this reason, the daily added, Tehran did not forget its commitments towards the 1925 Geneva accord banning chemical arms.

"The whole world knows that although the Islamic Republic of Iran suffered heavily due to the toxic weapons used by Iraqi forces against Iranian civilians and troops, yet Iranian forces never deployed poison gases in the course of the eight year Iran-Iraq War," the

article noted. Therefore, it added, German government should understand that Tehran has no desire of making any kind of "weapons of mass destruction."

"It is not a correct policy for Bonn to endanger its historical relations with such a politically and economically strategic country as Iran over the provisions of a simple contract," concluded the daily.

IRAQ

Signs of Uranium Mining Operation Examined

PM1610112090

[Editorial Report] London ITV Television Network in English at 1800 GMT on 13 October carries a 10-minute report from "The World This Week" program dealing with an alleged uranium mining operation in Iraq. Program presenter Michael Nicholson says there is evidence, based in part on a Soviet satellite photograph, that Iraq has been mining uranium from a remote northern corner of the country, just south of the Turkish border.

Correspondent Gwin Roberts makes the following report:

"A convoy of identical bullet-proof Mercedes heads into the mountains of northern Iraq. One of the cars is driven by President Saddam Husayn. In the past, the Iraqi leader avoided visits to the remoter regions of Kurdistan because the region was too dangerous. This year alone he has been there at least seven or eight times, ostensibly to visit his new palace in the Gara Mountains. Middle Eastern intelligence sources say he is going there for a very different reason: to visit a high-security project linked to Iraq's quest to build the atom bomb."

The following comments are then made by an unidentified Iraqi exile:

"We have good reason to believe that whatever nuclear development program Iraq has, which is not subject to international inspection, is located in northern Iraq. The exact spot is not known. But that it is in northern Iraq is something that has been verified by Iraqi exile sources, Iraqi defectors, and intelligence sources all over the world."

Roberts continues his report by adding that "Saddam Husayn's attention seems focused on a mountain range 40 miles south of Iraq's border with Turkey."

An unidentified Kurdish leader is then introduced. Sitting in front of a video console, he points to video of the mountain range and says:

"You can see that range. That is where the mining is taking place. Our information is very specific. Our sources have confirmed to us that what they are after is uranium ore, and they are mining for it. But also what we are absolutely sure of is they are building a huge tunnel on the western slope of the mountain." He adds that the

people working there are largely Iraqi engineers and military personnel. He notes that the personnel working there are rotated every month and suggests this could be because of the radiation or the secrecy surrounding the project.

Roberts goes on to say: "The Iraqis are known to have concentrated on an enrichment process that involves converting uranium ore into hexafluoride gas. This is then enriched in a centrifuge plant, thus purifying the isotope that drives a nuclear explosion."

Roberts continues: "Northern Iraq is sealed off from the outside world, so Kurdish reports have been difficult to verify. So, when we got the map coordinates of the reported mine, we had to find another way to check it out. For the first time on television, we used Soviet spy satellite pictures, combined with a revolutionary computer technique developed by University College, London. The satellite takes stereo pictures of the terrain. These are then digitized and matched by computer. The aim is to construct a precise three-dimensional terrain model of Kurdistan so we can fly down and take a closer look." The video shows a simulated image of the Kurdish mountains based on the satellite photos.

Roberts adds: "This view has until now been reserved for the military experts with access to superpower spy satellites. This new technology allows us to fly at will around the Gara Mountains, even though it is prohibited air-space. It gives us a close-up view of what is happening on the ground. It reveals large road systems on the Gara Mountains, which didn't exist two years ago. This flight also provides other important clues in our investigation. Uranium was found in volcanic rock not far from here in western Iran. And similar rock formations are visible here."

An unidentified British mineralogist, looking at the enhanced topographical image, points to a road network that appears around a particular mountain and notes that several of the ridges do not appear natural. He suggests that they could be embankments created from a mine entrance.

Roberts says that the Soviet pictures were scrutinized by analysts specialized in assessing high-altitude photography with high quality optics. He says they picked out one "extraordinary feature—a huge, strangely shaped building on the southwestern slopes of the Gara range." An artist's impression of the building is then shown. The artist's rendering shows a rectangular building, which is connected by a long enclosed passage to a round building.

Andrew Garfield of the National Image Analysis Center comments on the image: "The large site in the valley below the palace, I would say, is at least two or three stories high and could be as long as 750 meters. That is certainly not the sort of building one would expect in this part of the world. It doesn't look like a barracks to me. It looks more like an industrial facility. It would be an ideal location if you were trying to keep something secret and

if you wanted a high level of security. It is an extremely mountainous region. It is extremely difficult to get to, and I think it is significant that it is just about as far away from Israel as is possible to get in Iraq."

Paul Helliwell of the European Proliferation Center, in commenting on the photographs, says:

"Well, it looks like a uranium milling plant, if this is a uranium mine. I have seen photographs of items similar to this in Australia." Roberts remarks that the building is an unusual shape, to which Helliwell replies: "I'd expect the long structural conveyor belt and large-scale industrial machinery for breaking up the rock, which contains about 1 percent of the rock that will actually be U-308 uraninite ore."

Roberts notes that it "can't be coincidence that the Soviet satellite that took the picture of this building was stationed immediately above it in space."

He concludes his report by saying: "Satellites are providing vital evidence of the growing Iraqi military threat. These pictures show that Iraq may be much nearer in achieving self-sufficiency in its nuclear program than previously thought. If and when that happens, the West will find itself facing an even more formidable foe."

Brazilian Minister Confirms Sale of Uranium

TA2010081990 *Jerusalem Domestic Service in Hebrew*
1300 GMT 19 Oct 90

[Text] Brazil's Science Minister, Jose Goldemberg, has confirmed that about eight years ago his country supplied Iraq with several hundred metric tonnes of processed uranium ores. Still, according to the minister, this substance was not suitable for military use. Up to the start of the Gulf crisis, a Brazilian team, headed by a retired Brazilian Air Force general, was engaged in manufacturing air-to-air missiles in Iraq. Nevertheless, Science Minister Goldemberg told our correspondent Gid'on Reniez that Brazil's present government ended military cooperation with Iraq and evacuated all Brazilian civilians from Iraq after the Gulf crisis broke out.

ISRAEL

Ministry Denies Knowledge of Iraqi Atomic Bomb
TA2510163390 *Jerusalem Domestic Service in Hebrew*
1600 GMT 25 Oct 90

[Text] The French weekly *LE NOUVEL OBSERVATEUR* reports that Defense Minister Moshe Arens and the Israeli intelligence services are convinced that Iraq possesses uranium in sufficient quantities to produce at least one atomic bomb. The weekly asserted that two reports that reaching Jerusalem on this matter had aroused a great deal of concern. One report noted that the Iraqis are no longer permitting anyone to leave any of its three nuclear centers, and the other report pointed out that for the first time in 10 years, Iraq has refused to

allow any inspection of its nuclear installations by the International Atomic Energy Agency.

In Israel, the defense minister's media adviser stated that Israel has no such information; however, it is common knowledge that ever since Israel destroyed the atomic reactor in Baghdad, Iraq has been trying to achieve nuclear capability with the aid of Western companies and scientists. Countries throughout the world must take action to prevent the Iraqi leader from procuring atomic weapons.

MAURITANIA

Presence of Iraqi Missiles, Troops Refuted

AB1810090490 *Paris AFP in English* 0424 GMT
18 Oct 90

[Text] Paris, Oct 18 (AFP)—The foreign minister of the north African state of Mauritania, one of the few to have remained allied with Iraq since it invaded Kuwait, on Wednesday denied rumours that it had allowed Iraqi missiles and troops to be stationed on its territory.

"There are no Iraqi troops in Mauritania, and the story of the missiles is part of an anti-Iraqi campaign dating from before the invasion of Kuwait," Hasni Ould Didi told the Arab-language daily *AL-HAYAT* in an interview published on Wednesday in London and Paris.

U.S. officials have confirmed to Mauritania that their satellites had not picked up any signs of such a military presence, Mr. Ould Didi said.

The minister also said that his country condemned the use of violence in conflicts between states.

Mauritania had "cordial and brotherly relations with Iraq," but "that does not mean that we accept, or will accept, the annexation of Kuwait," he said.

If Iraqi ballistic missiles were to be installed in Mauritania, they would be capable of hitting targets in western Europe.

PAKISTAN

Bhutto Criticizes Nonproliferation Deal

BK2110013090 *Karachi DAWN in English*
20 Oct 90 pp 1, 12

[From DAWN Islamabad Bureau]

[Text] Rawalpindi, Oct 19—Ousted Prime Minister Benazir Bhutto has said her popularly elected Government was dismissed to deprive the country of nuclear reprocessing plants for which she had signed agreements with France and China.

Speaking at a mammoth public meeting at Liaquat Bagh on Friday [19 October], the former Premier said that a

similar conspiracy had been hatched when the government of her father late Zulfiqar Ali Bhutto was toppled because of his nuclear policy.

The public meeting was arranged by Pakistan Democratic Alliance (PDA) and presided over by a presidium comprising Mr Kabir Ali Wasti (PML) [Pakistan Muslim League], Mazhar Hussain Kazmi (TNFJ) [Terik-i-Nifaz-i-Fiqh-i-Jafria] and Sufi Gulzar (T.I) [Tehrik-I-Istiqlali].

Thousands of people of Rawalpindi and Islamabad reached the venue of the public meeting carrying large PPP [Pakistan People's Party] flags and dancing to the tune of PPP election songs.

At many points in the city, from where the PPP Co-Chairperson was to pass, the new election song of PPP, "Ya Allah Ya Rasool, Benazir Be-Qasoor" [Oh God, Oh Prophet, Benazir is Innocent] was being played on public address systems and a large number of people waited there to join the procession, although it was not announced that she would be coming in a procession to avoid any undue delay in the public meeting.

People started converging at Liaquat Bagh around 2:00 p.m. and by 5:30 p.m. the grounds were full to their capacity, and those accompanying Ms Bhutto's procession could not enter the ground. A 10-foot high stage was prepared over the already high pedestal cemented stage.

The crowd listened to the PDA leaders partiently for about four hours.

Ms Bhutto was accompanied by AJK [Azad Jammu Kashmir] Prime Minister Raja Munitaz Hussain Rathod.

She devoted a major portion of her 70-minute speech to stress that the main reason for dismissing her was PPP Government's full commitment to acquire nuclear technology for peaceful purposes.

Her statement was designed to counter the IJI [Islamic Democratic Alliance] propaganda through newspaper advertisements which suggest that the PPP was against Pakistan's nuclear programme. A four-column frontpage IJI advertisement was carried by almost every local newspaper alleging that the PPP was bent upon "selling" Kahuta in order to come into power.

Ms. Bhutto told the crowd that when she came into power, she was told that no country was ready to provide nuclear reprocessing plant to Pakistan, but despite that she undertook visits to France and China, and invited French President to visit Pakistan and that it was because of her democratic government that Pakistan succeeded in getting two nuclear reprocessing plants.

"It was dismissed to deprive Pakistan of these plants for which I had signed agreements she told the cheering crowds. [no end quote marks as published] She claimed that a handful of politicians wanted to make personal benefits at the cost of national interests.

The former Premier said she was also pressurised to sign the Nuclear Non-Proliferation Treaty (NPT) unilaterally but she refused to do so. "Now caretaker Prime Minister has assured the foreign countries that the IJI would unilaterally sign the NPT after coming into power," she asserted and referred to the American congressional report in which it has been pointed out that in the entire South Asian region, it were only Ghulam Mustafa Jatoi who had agreed to sign the NPT.

Ms Bhutto said she refused to sign the NPT because India had not signed that. "We are not a small or weak nation that we should sign it unilaterally. I had told them clearly that India will have to sign the NPT before Pakistan signs it," she recalled. "Now the caretaker Governments want to make Pakistan subservient to India and indirectly accepting its hegemony," she said and added "as a leader of a Muslim country I refused to bow to their pressure and accept India's hegemony."

Similarly, she pointed out that soon after coming into power she discarded the "cricket diplomacy" (pursued by General Ziaul Haq) in which India used to "bat" and Pakistan had always been "bowled out". "Instead, I adopted Bhutto diplomacy and told Indian leadership that Pakistan is interested in having good neighbourly relations with India provided that the latter agrees to vacate Siachen area which we had lost during Ziaul Haq's time and to settle the Kashmir dispute once for all", she said.

She said whenever her opponents were in power, Pakistan had been made the target of aggression by neighbouring India and "we lose a big part of our land." She recalled that in 1971 Pakistan lost East Pakistan, during Zia's regime we lost Siachen, "and now as claimed by Prof Ghafoor we have lost a good part of our land in Chitral area".

Ms Bhutto said since her opponents do not enjoy the people's support inside the country they were always on a weak wicket and thus India succeeds in its nefarious designs. "Not an inch of land was lost during my father's time or during my 20-month tenure because India knows that people are behind us and we will retaliate with full force," she claimed.

The deposed Premier said she also faced a similar situation as was being faced today by the caretakers. "But instead of getting nervous I faced these challenges boldly and it was because of my efforts that the U.S. aid was restored which was facing a threat of cut-off. But these inefficient people failed miserably and the U.S. aid has been stopped," she said.

While referring to the allegation of the caretaker ministers that Begum Nusrat Bhutto had been instrumental in cutting off the American aid, she said now the caretakers were trying to make false allegations to cover up their inefficiency. "I had never complained that Nawaz Sharif had been instrumental in aid cut off as they are screaming today," she said making the crowd to burst into laughter.

She said her opponents were inexperienced in international politics and that is why they failed to play any role in the Gulf crisis. She said it was to her credit that Pakistan, for the first time in the history of the country, succeeded in obtaining a unanimous resolution from the OIC [Islamic Conference Organization] Foreign Ministers Conference in support of Kashmiri freedom fighters.

"If I would have been in power today, Pakistan would have not only provided support to the smaller countries of the Gulf but also to Saudi Arabia and would have played an important and leading role in the Gulf crisis," she claimed.

Referring to the recent visit of Mr Jatoi to the Gulf countries, Ms Bhutto said he was sent by President Ghulam Ishak Khan to follow my precedent but he came back empty-handed. "He brought neither oil nor money," she remarked.

She said it was also because of her foreign policy that freedom struggle gained momentum in occupied Jammu and Kashmir. She said during the Zia and Junejo regimes, Kashmir issue was put in the backyard of the foreign policy but she revived this issue. "Once again Kashmir issue is being ignored. These IJI leaders do not want that Kashmir issue should be discussed at international forums like U.N., NAM [Nonaligned Movement] and at the Superpower summit," she observed.

Ms Bhutto alleged that the interim Prime Minister Ghulam Mustafa Jatoi had sent Maulana Kausar Niazi to India with a "secret message" to the Indian leadership that it should support IJI. "In return Jatoi has promised to revive cricket diplomacy. But I must warn them that people will defeat all such leaders who are betraying the Kashmiri freedom fighters. These people are afraid of me because I am a popular leader and enjoying the support of the masses," she said.

Minister Refutes Bhutto's Allegation

*BK2010170390 Islamabad Domestic Service in English
1600 GMT 20 Oct 90*

[Text] The minister in charge of local government and rural development and special assistant to the prime minister, Mr. Kamal Azfar, has said there is no question of Pakistan's unilaterally signing the Non-Proliferation Treaty without India's first doing so. He told a news conference in Islamabad today that no assurance whatsoever had been given by the government to the U.S. administration in this regard. He termed the accusation leveled by the former prime minister in the matter as a brazen-faced lie. Mr. Kamal Azfar said the government had now proved that this information had been leaked by the former prime minister and a senior minister as a result of which the Pressler certification had been withheld. He accused them of working against the national interest.

Bhutto Reports Jatoi Nonproliferation Accord

BK2010155590 Delhi ISI Diplomatic Information Service in English 0952 GMT 20 Oct 90

[Text] Former Prime Minister of Pakistan Mrs. Benazir Bhutto says that the caretaker government headed by Ghulam Mustafa Jatoi has agreed to unconditionally sign the Nuclear Non-Proliferation Treaty. Speaking at a public rally in Rawalpindi, Mrs. Bhutto said she has documentary evidence to support her statement.

AIR [All India Radio] Islamabad correspondent Suresh Chopra recalls that the Bush administration recently suspended the American aid to Pakistan to the tune of nearly 600 million dollars on the nuclear issue. According to reports, the U.S. Government has asked Pakistan to throw open its nuclear installations for an international inspection which Pakistan has refused to do.

Paper on 'Peaceful' Nature of Nuclear Program

*BK1410131790 Islamabad THE PAKISTAN TIMES
in English 14 Oct 90 p 4*

[Editorial: "The Nuclear Nettle"]

[Text] During his recent visit to the United States, Pakistan's Foreign Minister Sahabzada Yaqub Khan met Secretary of State James Baker and exchanged views with him on a number of subjects of interest and concern to the two countries. On return from the 45th session of United Nations General Assembly, Sahabzada Yaqub Khan said that he drew the attention of the US Secretary of State to the proposals put forward by Pakistan to make South Asia a "genuine nuclear non-proliferation region." In response to Mr Baker's concern regarding Pakistan's nuclear programme and its possible fallout on American assistance, Sahabzada Yaqub Khan assured him that Pakistan neither possesses nuclear weapons nor has it any intention of making them. Regarding the certificate required under the Pressler Amendment, the Foreign Minister said that it is at present under review by the US Administration.

Pakistan's principled stand on the nuclear issue is crystal clear. It has repeatedly declared at the highest forums that its nuclear programme is meant for peaceful purposes—to expand energy production in which it is deficient. Pakistan is in step with the global trend to banish nuclear weapons and is committed to harness nuclear power for human welfare. It is unfortunate that a well-organised lobby is engaged in spreading systematic disinformation about Pakistan's nuclear programme giving rise to doubts in sections of the US Congress about its nuclear ambitions. It is not easy to understand why such misgivings persist despite Pakistan's repeated declarations that it has no intention of producing nuclear weapons. In addition, Pakistan has continuously advocated and campaigned for creating a nuclear weapon free zone in South Asia and expressed its willingness to sign the NPT [Non-Proliferation Treaty] simultaneously with

India whose own nuclear ambitions are doubtful. In an address to the 42nd session of the UN General Assembly as far back as in 1987, Pakistan had put forward the proposal to call a conference of regional countries under UN auspices to discuss the nuclear question and prevent nuclear proliferation. That in itself proved Pakistan's bona fides on the matter. A country secretly making an atomic bomb would not come up with that kind of initiation. A nuclear weapon free zone in South Asia, mutual inspection of each other's nuclear installations, simultaneous signing of NPT and similar other proposals establish Pakistan's sincerity beyond doubt. Pakistan is not making a bomb but it will also at the same time zealously guard its sovereignty.

Paper Views Need for Consensus on Nuclear Issue
BK2110130090 Lahore THE NATION in English
21 Oct 90 p 2

[Editorial: "Not a Controversial Issue"]

[Text] Ms Benazir Bhutto's reaffirmation that her party will not compromise on the country's nuclear programme should dispel the fear that feuding politicians in a bid to get even with one another may lose sight of the national interest. The nuclear programme is not an issue on which any political party worth the name, regardless of its political orientation, can afford to take a position different from what has consistently been the country's official stance. And it was not incidental that successive governments in Islamabad refused to give in on this issue, notwithstanding "bullying and blackmail" by the so-called custodians of "nuclear non-proliferation". Needless to say Pakistan has time and again given assurances that it has no intention of making the "bomb" and is willing to sign the NPT [Nuclear Non-Proliferation Treaty], provided by the same logic India is also asked to do it. Nuclear capability, regardless of what use it is put to, is an integral part of Pakistan's national security and unless Washington's selective concern for nuclear devices getting into wrong hands, is made more

judicious and even-handed, Pakistan should not and hopefully will not under any circumstances consider it a negotiable matter.

Disagreement among political parties on major political issues is an imperative of the democratic process, and particularly on the eve of elections principal contenders for power are prone to highlighting their differences so as to facilitate the electorate's choice. Unfortunately, given the chequered history of elections in the country, the rules of the game for electioneering have not been clearly established and rival parties are often led astray to employ tactics that are liable to harm the national interest much more than hurting their opponents. The nuclear programme, for one, is an area which should have never been a bone of contention, since it is backed by national consensus and far from having any divergence of perceptions on the issue, there is not even scope for varying interpretations. It is not surprising that the Americans are using the "aid" leverage to pressurise Pakistan on the nuclear issue, their antipathy to it is not a sudden development and they have in the past too resorted to different tactics, depending on circumstances, to cow down the poor debtor. And if accepted as a national challenge there could be ways and means of dealing with it. Nevertheless, what matters most is that the nation, as a whole, regardless of party affiliations, should stand united on this issue, and not allow it to be used by either side as a gimmick to score points.

Punjab University Awards Ph.D. to Experimental Nuclear Physicists
91WD0048A Lahore THE PAKISTAN TIMES
in English 31 Aug 90 p 3

[Text] Lahore, 30 August—The Punjab University has awarded the degree of Doctor of Philosophy to Sheikh Muhammad Saleem and Mr Mahmud Ahmed on completion of their work on experimental nuclear physics.

Both the recipients were supervised by Dr Naeem Ahmed Khan, Chief Scientist PAEF and ex-chairman PCSIR and Prof M.A. Shaukat of Physics Department, University of Punjab.

Finland Asks Permission To Inspect Nuclear Units

91WP0013A Helsinki HELSINGIN SANOMAT
in Finnish 21 Sep 90 p 5

[Article by Jukka Perttu: "Finland Asks Permission To Inspect Nuclear Plants Near Border; Officials Meeting With Barlund in Leningrad Were Favorably Disposed to Proposal"]

[Text] Leningrad (HS)—Finland has proposed to the Soviet Union detailed safety inspections of its nuclear power plants close to the border. According to preliminary reports, Soviet officials took a favorable view of the request.

During the inspections, it would be determined whether the nuclear plants meet the safety requirements of Finland and other Western countries. To start with, they plan to conduct inspections of the nuclear power plants on Kola and in Lithuania as well as those near Leningrad, some 10 plants in all.

Environment Minister Kaj Barlund proposed the inspections when he discussed matters with the Soviets in Leningrad on Thursday.

At least leaders of the city of Leningrad and the surrounding area supported the proposal. A representative of the Soviet Environment Ministry also thought the idea was a good one and promised to pursue the matter. It was decided to continue to discuss the matter as soon as possible.

The Finnish initiative stems from, among other things, the fact that the West Germans have noticed serious shortcomings in the East German nuclear power plants. It is unlikely that a single one of the eastern part of the country's nine nuclear plants will be allowed to continue to produce electricity after reunification of the two Germanys.

The Radiation Safety Center, which has collaborated with the Soviets before—specifically in connection with the plants in areas close to the border—would perform the safety inspections. Finnish experts have visited the Kola and Leningrad plants, but their visits were of a general nature and they did not make any real safety comparisons.

Ecology Program for Leningrad

When he met with Soviet Karelian leaders on Wednesday, Barlund was assured that the planned nuclear plant would not be built in Karelia. The decision is fairly certain inasmuch as the planning equipment has been dismantled.

However, the Karelian pumping power plant project is still progressing. Now a site 50 km south of Paanajarvi is being considered for it. Paajarvi would become the lower reservoir. Peak energy consumption needs on Kola and in Leningrad would be met with the power plant.

Environment officials for the Leningrad area have commissioned Jaakko Poyry to conduct a study of how the area might fulfill its international ecological obligations. Foreign investments totaling 4.2 billion markkas would be required to carry out the program by 1995, and, in addition, Soviet investments amounting to 2 billion rubles. Because construction of the Leningrad dam is equivalent to 2 billion markkas, the cost of the ecology program would be enormous.

The Soviets hope that at least part of the funding will be obtained through the Nordic Investment Bank and the rest as a foreign credit.

The program will be presented in greater detail at the conference of Nordic and East European countries environment ministers to be held in Helsinki at the end of October, at which cooperation on environmental affairs, technology transfer, and financing concerns will be considered. Among others, representatives of the European Community and the Baltic Protection Commission will participate in the conference.

Kaj Barlund thinks that the plans for reducing discharges produced in the Leningrad area can be realized, but that this will require a change in attitude and strong foreign support.

The purification of Leningrad waste water has not been progressing as expected. At the present time, 70 percent of the waste water is to some extent being purified. The city has major problems because waste water from industrial plants, for example, is channeled into the municipal network without prior treatment, as a result of which many different kinds of toxic substances find their way into the purification plants. These weaken the effectiveness of the biological process. The construction of separate purification systems for industry is an enormous task.

During the discussions on Thursday, the Soviets further proposed that Finnish firms buy shares in Leningrad companies that are to be privatized. Our eastern neighbors hope that the new private companies will also produce products that can be sold for Finnish markkas.

Estonian Minister: Radioactive Water Into Baltic

91WP0013B Helsinki HELSINGIN SANOMAT
in Finnish 27 Sep 90 p C1

[Unattributed article]

[Text] Tallinn (HS)—Estonian Environment Minister Toomas Frey suspects that the uranium refinery that is part of the Soviet defense industry plant complex at Sillamaki has been and may still be dumping some of its radioactive waste into the Gulf of Finland. Frey, who recently went through the area with a sensitive radiation meter, said that he had noted a distinct rise in radiation readings in coastal waters.

Frey believes that the refinery is discharging waste deep down onto the floor of the sea through a pipe. He is demanding that the matter be thoroughly investigated. Frey said on television that he had also measured the radiation content of food items in grocery stores and noted increases in readings for eggs and chicken, in particular. He suspects that enriched fodder brought in from the Soviet Union is the cause. Frey is also the leader of the Estonian Greens.

Problems at Nuclear Power Stations Reported

91WP0020Z Moscow IZVESTIYA (Union Edition)
in Russian 20 Oct 90 p 7

[Yu. Rogozhin report: "The Nuclear Power Stations in the Last Quarter"]

[Text] During the period of July to September, 28 units with a combined capacity of about 18,000 megawatts were on line at nuclear power stations, while 17 units were off line for preventive maintenance and reloading of nuclear fuel; six units (units 1 and 2 at the Armenian, Beloyarsk, and Novovoronezh stations) were shut down. During this period there were 39 unit shutdowns, including 22 cases of automatic shutdown by safety equipment. The initial causes of shutdowns were as follows:

- mistakes by nuclear power station personnel—5;
- malfunctions in electrical equipment—16;
- malfunctions in control systems—7;
- malfunctions in thermomechanical equipment—11.

It can be seen from these figures that in 70 percent of cases the reasons for the shutdown of power units were malfunctions in electrical and thermomechanical equipment. This was the result both of defects in design schemes and design and production, and also omissions in operation.

During this quarter the organs of the USSR State Inspection for Nuclear Energy in Industry introduced temporary restrictions on the level of power permitted at individual units at the Zaporozhye, Rovno, Khmel'ničkiy, Novovoronezh and Ignalina nuclear power stations. The restrictions are connected mainly with delays in compliance with a number of organizational measures following the completion of scheduled unit maintenance.

As reported earlier (IZVESTIYA No. 216, 1990), starting 1 September an international scale was put into operation in the USSR to describe the seriousness of events at nuclear power stations. An evaluation of events conducted by the USSR State Inspection for Nuclear Energy in Industry at nuclear power stations showed the following: The shutdown of Unit No. 2 at the Smolensk nuclear power station on 22 July because a fire in a high-voltage cable was classified at the lowest level, namely, "an insignificant event at a nuclear power station." But earlier this incident had been assessed as a "zero level event not affecting safety." The other events at nuclear power stations were

categorized as "below the scale" or "outside the scale," that is, the events were of no importance with respect to safety.

A. Belyayev, first deputy chairman of the USSR State Inspection for Nuclear Energy in Industry, answers questions from the editor:

[IZVESTIYA] Inertly, Ivanovich, I foresee bewildered questions from readers: Almost 40 emergency shutdowns of nuclear power units were recorded and all of them (with a single exception) were "below the scale." The experts even categorized the event at Smolensk as "an insignificant event." So why, they will ask, was it necessary to shut down the units?

[Belyayev] A nuclear power station is a complicated technical system equipped with numerous devices and mechanisms, each of which in principle cannot be absolutely reliable. The safety rules at nuclear power stations provide for the automatic shutdown of a unit when any deviation from nominal operating conditions can lead to a lowering of the safety level. With respect to the international scale for assessing the seriousness of events at nuclear power stations, it classifies those incidents that affect (or could affect) safety with the risk of the emission of radioactive material above permissible levels. Well, most incidents at the power stations over the last three months were not associated with any deterioration in safety. And the reactor shutdowns themselves were merely a precautionary safety measure.

[IZVESTIYA] Many nuclear power stations have been built abroad using Soviet designs and Soviet equipment. How do things stand there with respect to safety?

[Belyayev] Yes, our nuclear reactors are being operated in the countries of East Europe and in Finland. We do not inspect them but we do have information on the achievements and problems there.

Now to the essence of the question. It should be noted that some of the problems there are similar to ours. This has been confirmed in particular by experts from the FRG who inspected the nuclear power station at Greifswald on GDR territory. A number of proposals have been put forward aimed at improving safety. This applies primarily to the power units on the first-generation VVER-440, built according to plans in the late 1960's and early 1970's. A number of measures have been devised in the Soviet Union to improve the safety of these units, and these are already being put in place during scheduled reconstruction work. In principle, similar steps can also be taken for the first units of the nuclear power station at Greifswald. But here it is a matter of economics: There is an abundance of electric power in Germany and will reconstruction be advantageous under those circumstances? It has still not been possible to find a company that will assume the function of operating organization and provide the funding required to carry out the necessary modernization of the units at Greifswald.

With respect to the VVER-1000's that have been built and are being built abroad, on the whole they satisfy international requirements.

GERMANY

Firm Probed for Sending Arms Technology to Iraq

AU2410131390 Hamburg DER SPIEGEL in German
22 Oct 90 p 15

[Unattributed report: "Iraq's Helpers in Armament"]

[Text] The company Project Betreuungs GmbH (PBG) from Freising is suspected of having been another helper in arming Iraq. The Munich II public prosecutor's office has started investigating the managing director of the Bavarian company. According to Senior Public Prosecutor Friedrich Bethke: "This is a hot potato." PBG, which belongs to the Consen Group, is supposed to have played a key role in roundabout deliveries of important technology via Argentina and the Middle East, and it is considered an important partner of the Messerschmidt-Boelkow-Blohm (MBB) concern. PBG is said to have delivered to Egypt MBB's studies on the construction of a fuel air bomb with an explosive force similar to a nuclear bomb; via this roundabout way, the blueprints went to Baghdad—Iraq now has the superbomb. Parts of the Condor missile system, which MBB had designed for Argentina's Air Force, also went to Buenos Aires and then to Iraq via PBG, according to findings by the investigators. Last year the FRG Government stated that it "cannot confirm" any involvement by PBG "in the establishment of a research and development center for the construction of missiles in Iraq."

GDR Chemical Weapons, Missile Aid to Iraq Detailed

AU2310214090 Hamburg DER SPIEGEL in German
22 Oct 90 pp 97-101

[Unattributed article: "The First Circle of Hell"]

[Text] The generals were listening patiently to Professor Karlheinz Lohs from Leipzig, who gave a lecture in Baghdad on the reduction of chemical weapons. After the lecture, a senior Iraqi member of the general staff addressed the professor.

"You Germans have a great deal of experience in gassing Jews. We are interested in this. We would like to know how this knowledge can be used to destroy Israel," he stated. The chemical engineer and toxicologist Lohs could have provided the required information, but he did not want to. "I was shocked," he stressed. Since this incident in spring 1972 the GDR scientist has avoided Iraq.

It became clear to him at the time "that Iraq wanted to produce chemical warfare agents by all means." Saddam Husayn's strategists were trying to find specialists for this purpose, "people who had already worked in the first circle of hell."

At least seven managers of the Kolb KG company in Hesse and the Hamburg-based W.E.T. company [Water

Engineering Trading GmbH] allegedly carried out this task in Iraq at a later point. They are suspected of building poison gas plants in Samarra and al-Fallujah. One was exempted from arrest, two were released on bail, and four are still in prison (DER SPIEGEL 34/1990).

The Darmstadt Public Prosecutor intends to bring a charge against the managers suspected of being involved in the construction of the poison gas plants, and the defending attorneys want to ensure the acquittal of their clients with the help of renowned scientists. One expert with a good reputation has been found—the 61-year-old former visitor to Baghdad Lohs from Leipzig.

Together with the Bonn lawyer Torsten Arp, the defending attorney of a detained former representative in Iraq, Lohs examined the confiscated material—four tonnes of evidence—at the Customs Criminal Institute in Cologne the Friday before last [12 October].

A lengthy trial is expected in which experts' reports may determine the outcome. The most important expert of the public prosecutor is the Swiss scientist Werner Richardz, who explicitly relied on the work of the former GDR citizens Lohs in his 50-page analysis.

The dean of the Technical University in Zurich came to the conclusion in his expertise ("expertise on the chemical technology used at the plants in Samarra/Iraq"), published on 19 July, that the chemical plants supplied by the Germans were especially constructed for the production of lewisite, prussic acid, and tabun.

According to official indications, the six plants named Ahmed I, Ani, Mohamed, Meda, Ghazi, and Iesa [spelling as published] were said to be for the production of pesticides—a trick that is well known to Lohs. "The diabolical thing about modern chemical plants is that one can buy plants for the production of pesticides on the world market, which can later be turned into plants for the production of chemical warfare agents," he stated in NEUES DEUTSCHLAND on 16 August.

Some of Lohs' colleagues in the West are irritated about the fact that the chemical disarmament expert assumes such a mandate. A partial confession has already been achieved in the Kolb case. Lohs did not accept the task because of the money, he emphasized. "We have not even fixed the fee." He wants to assume the role of a "neutral person" in the trial, which is quite naive or quite shrewd.

Professor Dr. Dr. Karlheinz Lohs, with whose help the acquittal of the West German suppliers to Iraq should be ensured, is no ordinary scientist. The director of the Leipzig research center for chemical toxicology of the GDR Academy of Sciences was also an important political figure in the old state.

Lohs was a member of the Socialist Unity Party of Germany [SED] for 42 years, railed at the "German

militarists," and frequently spoke at party congresses. He was also a travel cadre, which "was quite natural in his position," he stated.

As a scientific adviser of the GDR Government for chemical disarmament, Lohs participated in all important international conferences. He was chairman of the GDR committee for scientific questions concerning the safeguarding of peace and disarmament, and he was a member of the delegation that negotiated, together with the Bonn Social Democratic Party of Germany, a joint proposal for a chemical-weapons-free zone in central Europe.

Lohs enjoyed the confidence of SED Politburo member Werner Axen and of other senior officials, but he has also had a seat and a vote in the renowned Stockholm Peace Research Institute for two decades.

Thus, the researcher Lohs embodies the contradictions of great GDR careers. He is proud of the 68-percent vote of his colleagues with which they expressed their confidence, but there was also an anonymous letter to DER SPIEGEL on the bulletin board, warning against such "incorrigible" old "SED supporters" as Lohs.

The chemical weapons expert is being viewed with distrust by his colleagues in the West. Lohs admitted in West German papers that he is "partly responsible," which makes people even more skeptical. "Lohs is the Krenz of science," poison gas expert Klaus Hoffmann from Hildesheim believes.

The GDR warfare agents expert claims that he was never aware of the "real extent of research in our country." Only after the revolution did he learn that "the GDR's ultra poison laboratories were completely oversized," for example. "Science and researchers like me were skillfully misused as figureheads." Friendly military officials used to "serve me coffee, but they never told me the truth."

As a matter of fact, Lohs should have known the truth. However, the professor, like many of his compatriots, apparently repressed certain things.

Western intelligence services have meanwhile investigated the GDR's role in Iraq's arms buildup. It is true that East Berlin's aid cannot be compared with the large-scale exports from West Germany, but it is more comprehensive than once thought.

The National People's Army (NVA), for example, built a maneuver area for nuclear, biological, and chemical weapons near Baghdad in the eighties, on the model of the training area in Storkow in Brandenburg. It included control towers for the emission of radioactive gamma rays, special buildings and tracks for the decontamination of vehicles, as well as a shooting range with dummy buildings. The chemical warfare expert Lohs did not know anything about that.

Former Defense Minister Eppelmann used to get furious about the fact that the GDR supplied 24 bridge-laying tanks to Iraq until the middle of the year. However, this

was not everything: According to the CIA, the GDR supplied at least 50 T-55 tanks to Iraq during the Gulf War. The old weapons were intended to successfully resist ultrafast shells and even the ultrahot plasma jets of antitank missiles.

The British intelligence service discovered that the GDR also participated in Saddam Husayn's missile program. Dozens of GDR technicians are believed to have worked on improving the old Soviet Scud-B missiles. By reducing the payload and enlarging the fuel tanks, the range of the missiles was tripled to about 900 km. Experts had assumed so far that perhaps only West German and Italian technicians participated in the modernization of the Scud-B missiles, known under the codes 124, 144, and 1728.

According to the latest findings, GDR technicians were at least accomplices in constructing the poison gas plants at Samarra and al-Fallujah. During interrogations, several witnesses referred to GDR involvement, and the secret services have made similar findings.

The West German Embassy in Baghdad must have known about the GDR's involvement. When the builders of the plants for the alleged production of pesticides feared air raids by the Israelis, evacuation plans were prepared and exercises were carried out in the bunkers of Samarra.

During the exercises the question of who was responsible for the GDR technicians was raised. After consultations between Baghdad and Bonn, West German diplomats in Iraq stated that they were not responsible for the GDR fitters.

Professor Lohs, the neutral expert, claims to have heard "for the first time" about GDR involvement in the Samarra poison gas plant. He "did not have the slightest idea."

As Lohs told NEUE BERLINER ILLUSTRIERTE recently, he briefed the GDR Embassy in Baghdad and the East Berlin Foreign Ministry about the wishes of the Iraqi general staff concerning poison gas for the fight against Israel.

Lohs said: "I closed my eyes, and, as the saying goes, the leading comrades certainly knew what they were doing."

SWITZERLAND

Schmiedemeccanica-British-Belgian Connection Exposed

90WC0113Z Geneva JOURNAL DE GENEVE
in French 4 Sep 90 p 12

[Article by Pierre Hazan: "Nuclear Armament: Illegal Sales to Iraq; Swiss Firm Under Anglo-Iraqi Control"]

[Text] Biasca (AFP)—Nearly a fifth of the capital of the Swiss company Schmiedemeccanica of Biasca in the

Canton of Ticino, suspected of having illegally delivered to Iraq metal parts that could contribute to the fabrication of nuclear weapons, has lately been in the hands of a London company controlled by the Iraqi Government, we learned on Monday. On Monday Schmiedemeccanica at least in part confirmed press reports on this subject, indicating that some of the company's shares had been sold to an "Anglo-Arab" group.

(From our correspondent in London)—A company domiciled in London but controlled by Iraq is alleged to be continuing to illegally supply the Saddam Husayn regime with conventional weapons as well as nuclear and chemical technology. This company, the Technology Development Group (TDG), is supposedly getting ready to acquire 30 percent of a Swiss company that is also involved in the illegal transfer of nuclear technology to Iraq.

Monday evening the BBC broadcast an investigation that tended to prove that, despite the boycott directed against Baghdad, the TDG continues to supply the Iraqi regime with arms and sensitive technology. This company is alleged to be controlled by Al-Arabi Trading, domiciled in Baghdad and owned by the Iraqi Ministry of Industry and Military Industries. Last June TDG is alleged to have acquired 18 percent of the capital stock of Schmiedemeccanica, Limited, a Ticino company, and to be preparing to acquire another 12 percent in the next few months. The latter company is under investigation by the Confederation's Department of Public Economy, which suspects that it has delivered parts that can be used to manufacture atom bombs. Several crates shipped to Iraq by the Ticino company were in fact confiscated at Frankfurt airport. They contained lids and bottoms for gas centrifuges that could be used to enrich uranium.

TDG is alleged to have collaborated with the Brussels company Space Research Corporation, a company that was closely implicated in the Iraqi plan for the construction of the notorious "supercannon" and whose general manager, Canadian George Bull, was mysteriously murdered as he was leaving his Brussels apartment just as the scandal broke.

The accusations made on the BBC program "Panorama" with regard to TDG activities gave rise to a vehement reaction by the Labor Party. Gordon Brown, one of the party officials, declared that he would do everything in his power "to prevent TDG from continuing its operations." The British Department of Trade and Industry and the Department of Foreign Affairs declined to express an opinion on the televised program. However, the British Government might very well break its silence this week in the context of the special session of Parliament to be devoted to the Gulf crisis. The Left has let it be understood that it will indeed demand explanations of the prime minister aimed at determining how an Iraqi-British company could continue to violate the blockade of the Saddam Husayn regime the way it has.

NPT Seen Porous; IAEA Weaknesses Noted

91WP0014A Geneva JOURNAL DE GENEVE
in French 18 Sep 90 pp 1, 4

[Article by Antoine Bosshard: "Nuclear Proliferation: Setback in Geneva"]

[Text] Delegates from 85 countries meeting in Geneva dispersed late Friday night in complete disarray. Thus ended a curious exercise, only a ritual but yet indispensable: the rereading and "aggiornamento" of the Nuclear Non-Proliferation Treaty (NPT) that went into force 20 years ago.

At this fourth NPT conference, the usually humdrum proceedings were reportedly thrown into disarray by recent events: On opening day, the West German weekly SPIEGEL revealed that a number of German and Swiss companies supplied Iraq for several years with versatile materials that could be used for (among other things) the manufacture of an atomic bomb. Coming in the midst of the Gulf crisis, the disclosure could not be dismissed lightly. It further exacerbated public fears of the threat posed by the Iraqi president. At the same time, it showed that the treaty, despite its impressive machinery, was more porous than previously thought, since firms in two countries that had ratified it were able to slip through loopholes in the rather loose national regulatory machinery. A third state—Iraq, also a party to the treaty—violated the spirit if not the letter of its commitments. Unscrupulously.

Harsh Light

This cast a particularly harsh light on the reality of proliferation, which has been a constant worry for the great powers since the 1960's. Hoping to prevent atomic weapons from falling into the hands of unstable regimes or irresponsible madmen, they tried to bar access to fissionable materials (ther to the equipment needed for their manufacture): The chosen vehicle was the NPT, which went into force in 1970.

It is obviously an unequal treaty, one that denies nuclear weaponry to the immense majority of countries, especially those in the Third World, as if the more to underscore the military and technological hegemony of the superpowers. That, at least, is how several countries have interpreted it: not only China and France, but also India, Pakistan, Argentina, and Brazil—countries that (along with Israel and South Africa) are on the threshold of nuclear capability.

But in exchange, the atomic powers that promoted the treaty—the United States, the USSR, and Great Britain—pledged to reduce their own arsenals substantially (Article 6) and to provide signatory countries with the civilian technology they need. Moreover, the delivery of civilian nuclear materials to nonsignatory countries is subject to rather strict controls. The mission of the

atomic energy agency in Vienna (IAEA) [International Atomic Energy Agency] is to verify compliance with the treaty's provisions.

Third World Frustrations

So it is not surprising that over the last 20 years this treaty has provoked two quite divergent kinds of concerns: those shared by the majority of signatories (but also by China and France) concerning how to prevent the spread of atomic weapons, especially to countries in the Third World; and those shared by the latter countries, which grind their teeth in frustration, whenever a compliance review meeting is held, at their helplessness in face of the nuclear monopoly exercised by the industrialized powers. Chief among their grievances: The fact that over the years the great powers have refused to reduce their arsenals of terror; and the seeming injustice of the fact that controls are often less stringent for nonsignatories on the threshold of nuclear capability (India, for example) than for countries party to the treaty. They are also irritated by the innumerable controls placed on the export of sensitive materials in order to impede transfer of the technology.

This year, with the Cold War ended, prospects for progress appeared excellent. For the first time in years, the two superpowers seemed to be turning over a new leaf. For the first time, they announced significant reductions in their strategic arsenals—first by eliminating medium-range missiles in Europe (the INF treaty, as it is called), and ultramodern armaments, as well. In addition, an important agreement seemed imminent on long-range weapons (the START talks), with Moscow and Washington preparing to reduce by half (or more) their current stocks. In Vienna, negotiations on conventional arms reduction in Europe were going well. On 1 June, American and Soviet officials announced a major agreement on the destruction of their chemical arsenals (80,000 tons).

Handful of States

Nevertheless, a number of Third World countries were not at all satisfied: A small but intensely active group of countries (led by Mexican Ambassador Miguel Marin Bosch) criticize the two superpowers for not having destroyed the nuclear warheads carried by the missiles eliminated from their arsenals under the INF. More, they believe that Article 6 of the treaty is still being violated by the superpowers, which have not stopped their nuclear testing, a source of proliferation. The criticism is not totally justified: all the nuclear powers (including France) have cut back on testing in recent years. The USSR, which is leading the way in terms of reduced testing, is even going to abandon its test facility in the Arctic, where tests will be much more difficult (and much more expensive). France itself is reported to be thinking about abandoning Mururoa for other islands.

In Geneva, in the last few weeks, the whole strategy of the militant nonaligned group has been to demand adoption of a schedule for the gradual elimination of atomic testing. By so doing, they are holding a sword of Damocles over the survival of the treaty: in 1995, just five years from now, the NPT comes up for renewal. If the United States, Great Britain, and the USSR—the only nuclear powers signatory to the treaty—refuse to commit themselves to a mandatory schedule, the treaty's life might not be extended for long: not for 10, 20, or 50 years, but perhaps only for a few years more, they have indicated.

Washington is having none of it: The Americans do not reject the possibility of reducing the size of weapons tested (the current ceiling is 150 kilotons), but they clearly intend to keep their future options open. They are also unwilling to foreclose the possibility of the tests that would be needed to develop the third generation of nuclear weapons: neutron bombs, electromagnetic pulse bombs, deep-penetration devices, X-ray laser weapons. Are these tests absolutely indispensable? On this point, the American position is disputed by certain experts, especially with regard to testing of weapons already in the U.S. arsenal. The USSR says it is ready to stop testing altogether. France, which is not a signatory to the treaty, is following the U.S. lead on this issue.

Symbolic Confrontation

The contest between the United States and that handful of nonaligned countries (including Mexico, Indonesia, Yugoslavia, Sri Lanka, and Venezuela) is taking the form of a symbolic confrontation between North and South, at a time when the treaty with its 138 signatories has shown itself to be more necessary and useful than ever before. "It may have its faults, but it is irreplaceable," says one nonproliferation expert. "The treaty really works. There has been no gross violation of its provisions in 20 years."

To insist on the inadequacy of steps already taken toward disarmament, as the nonaligned countries do, is to ignore a fact of critical importance: The East-West confrontation that sustained the arms race is over. And that extinction could even make further disarmament agreements irrelevant.

Thus Mexico and its followers seem, in their quixotic battle over Article 6, to be giving short shrift to much more serious problems besetting the treaty. The most urgent and obvious problem is how to achieve greater control not only over fissile materials (handled by the agency in Vienna) but also over other materials, rare metals, and dual-use equipment that might be acquired by countries like Iraq and Libya (parties to the treaty), or by North Korea and Pakistan (nonsignatories), in order to build an atomic bomb.

It is true that in 1977 a group of industrialized countries known as the "Group of London" established a list of sensitive products which prospective purchasers could obtain only by pledging to provide adequate safeguards and refrain from noncivilian applications. But the

Group of London is currently inactive, and the list applies only to countries that have not signed the NTP. A separate list, drawn up by the "Zanger committee," has been established under the treaty itself to cover sensitive materials.

But experience shows that some states do not exercise adequate control over the export of sensitive products and materials—special steels for centrifuges, detonators, tritium, beryllium, etc. It is likewise difficult to prevent the (prohibited) reexport of materials originally destined for a country that obtained a proper license. The list of excessively lax countries includes the FRG and Switzerland, whose internal legal controls—export licenses and customs inspections—strike some experts as clearly inadequate.

The document that was to be adopted on Friday night thus called for stricter controls (reinforced by surprise inspections). But any surveillance measure in the domain of equipment immediately stirs up protest among the member countries, which claim they are being deprived of technology transfers the NPT promised them (Article 4) in exchange for their adherence.

Fragile IAEA

A second concern: The low budget allocated to the international agency in Vienna (no growth in real terms) raises fears that the IAEA may be unable to carry out its responsibilities credibly. One may seriously question whether it will have enough resources to exercise (as it should) increased vigilance over:

- countries that have newly acquired uranium enrichment technology;
- stocks of separated plutonium (which continue to grow);
- laser enrichment installations;
- remote-controlled reprocessing facilities.

A final concern is the situation in the USSR, a major nuclear power whose internal crisis could lead, in the opinion of some experts, to very dangerous developments.

Thus, because a handful of Third World countries chose to grandstand, pointing an accusing finger at the great powers (meaning the United States) over a real but not critical proliferation problem (testing), the treaty's future has been brought into question. It is not clear what the international community has to gain from it. The next meeting is scheduled for early 1991, when the same activists have scheduled a meeting (as provided under the treaty) to consider amendment of the 1963 partial nuclear test ban treaty. Confrontation may break out anew. And without any resolution, for the same reasons that led to the recent setback in Geneva.

TURKEY

Nuclear Pact With Argentina 'Secretly Signed'

TA2610161190 Istanbul *MILLIYET* in Turkish
26 Oct 90 p 10

[Report by Turan Yavuz]

[Text] An agreement for a nuclear station was signed between Turkey and Argentina last Friday. Under the agreement, which was secretly signed in Ankara, two 25-megawatt nuclear reactors will be built, the first in San Luis, Argentina. Although, the site for the Turkish reactor is not yet known, it is believed it will be in Akkuyu near Mersin.

It has been learned that this joint project will be undertaken on Turkey's side by STFA [Sezai Turkes-Fevzi Akkaya Company], the Turkish Atomic Energy Institute, and the Turkish Electricity Board, and on Argentina's side by CNEA, the Argentine National Commission for Atomic Energy.

The United States Is Nervous

One of the most important elements of the Turkish-Argentine agreement is that Argentina will make a total transfer of technology for the construction of the reactor. This is making the United States, as well as the International Atomic Energy Agency, nervous.

It has been learned that the Bush Administration is pressuring Argentina not to transfer technology to Turkey. The United States is nervous about the possibility that Turkey might sell this technology to other countries, mainly Pakistan. That is why Washington wanted Turkey to cooperate with Germany or Canada, two other countries that had taken part in the tender Turkey had issued. Had either one of them won the tender, the technology transfer would have been extremely limited. In short, they would have been in control.

However, following months of negotiations and lobbying, Turkey decided to sign this agreement with Argentina.

The agreement that was signed at the Argentine Embassy in Ankara last Friday was kept secret from the public. Apparently, the reason was to prevent countries such as the United States or Germany from exerting last-minute pressure on Turkey and Argentina not to sign the agreement.

Energy and Natural Resources Minister Fahrettin Kurt was also present at the secret signing ceremony in Ankara and signed the agreement as an "honorary member." The real signatures were those of Attila Ozmen from the Turkish Atomic Energy Institute, and of CNEA chairman Manuel Mondino. The Argentine Ambassador in Ankara Adolfo Sarachom, who played a great role in the agreement, was also one of the signatories.

Under the agreement, the STFA and CNEA will jointly build a 25-megawatt reactor in Argentina. The work is to begin in March. About six months after that, the construction of the second reactor will begin in Turkey. It is believed that this reactor will be built in Akkuyu, Mersin, because the area is one of the calmest in terms of "seismic movement."

Only 100,000 houses will be lit by this reactor because it will only be 25 megawatts.

The issue that makes the United States nervous is the following: Six years after it acquires this technology, Turkey, if it wants, will be able to produce 95-percent enriched uranium. That ability is also known as "the capacity to make nuclear bombs."

For now, the reactor to be built in Turkey will require only 4-percent enriched uranium, and that is not enough to make a nuclear bomb.

However, a reliable source told us: "With this reactor, Turkey can make 95-percent enriched uranium in the coming years. However, it needs to build big factories for that. That is checked and can be noticed by the International Atomic Energy Agency. Therefore, we are not very concerned about the issue."

It has been learned that an article in the agreement stipulates that, if it wants, Turkey can sell this technology to other countries in the future. In other words, Turkey will be able to sell this technology to the countries of its choice without asking Argentina's permission.

Sources in Ankara say that the correspondence between President Turgut Ozal and Argentine President Carlos Menem during the negotiations played an important role in the signing of the agreement, which opened a new door for relations between the two countries.

It was known that during his visit to New York, President Ozal met President Menem, who was there for the UN sessions. Sources say that the issue of nuclear reactors was discussed at their meeting.

Ozal: Nuclear Stations Needed in 'Coming Years'

TA2710064390 Istanbul CUMHURIYET in Turkish
26 Oct 90 p 9

[Text] Ankara (CUMHURIYET Bureau)—President Turgut Ozal has approved Turkey's nuclear station project. Ozal said: "As a developing country, Turkey will need several nuclear stations in the coming years."

Prime Minister Yildirim Akbulut pointed out that thermal power [as published] stations do not pollute the environment and that Turkey needs energy and it needs to develop.

Energy Minister Fahrettin Kurt said that the necessary measures are being taken to prevent even a one-minute power cut. He added: "We will emphasize the city power networks in the coming years because of speedy urbanization."

UNITED KINGDOM

Thatcher: Sanctions Possible After Iraqi Pullout

LD2910084990 London PRESS ASSOCIATION
in English 0618 GMT 29 Oct 90

[Report by Mark Atkinson]

[Text] Mrs. Thatcher has warned sanctions might have to be continued against Iraq even after a withdrawal of its troops from Kuwait. They could be needed to prevent Saddam Husayn using his stockpiles of chemical, biological and nuclear weapons, she said.

In an interview with BBC Television's Breakfast News, the prime minister insisted the only way to settle the Gulf crisis was by Iraq withdrawing. She said the legitimate government of Kuwait would also have to be restored and compensation paid for the "terrible damage to both people and property."

Mrs. Thatcher went on: "We shall have to consider how to deal with the chemical weapons, biological weapons and nuclear weapons which Iraq has so that they could never be used. "That we'd have to do through the United Nations. It is possible that we could keep on the sanctions until we had settled the matter."

She said otherwise "We shall be back in precisely the same position within a few years". The prime minister repeated she was prepared to use military options to force Iraq out of Kuwait.

"It is not a decision I ever welcome, but you do not appease an aggressor, otherwise, as Winston Churchill said, there is no end to the humiliation you may have to endure."

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